

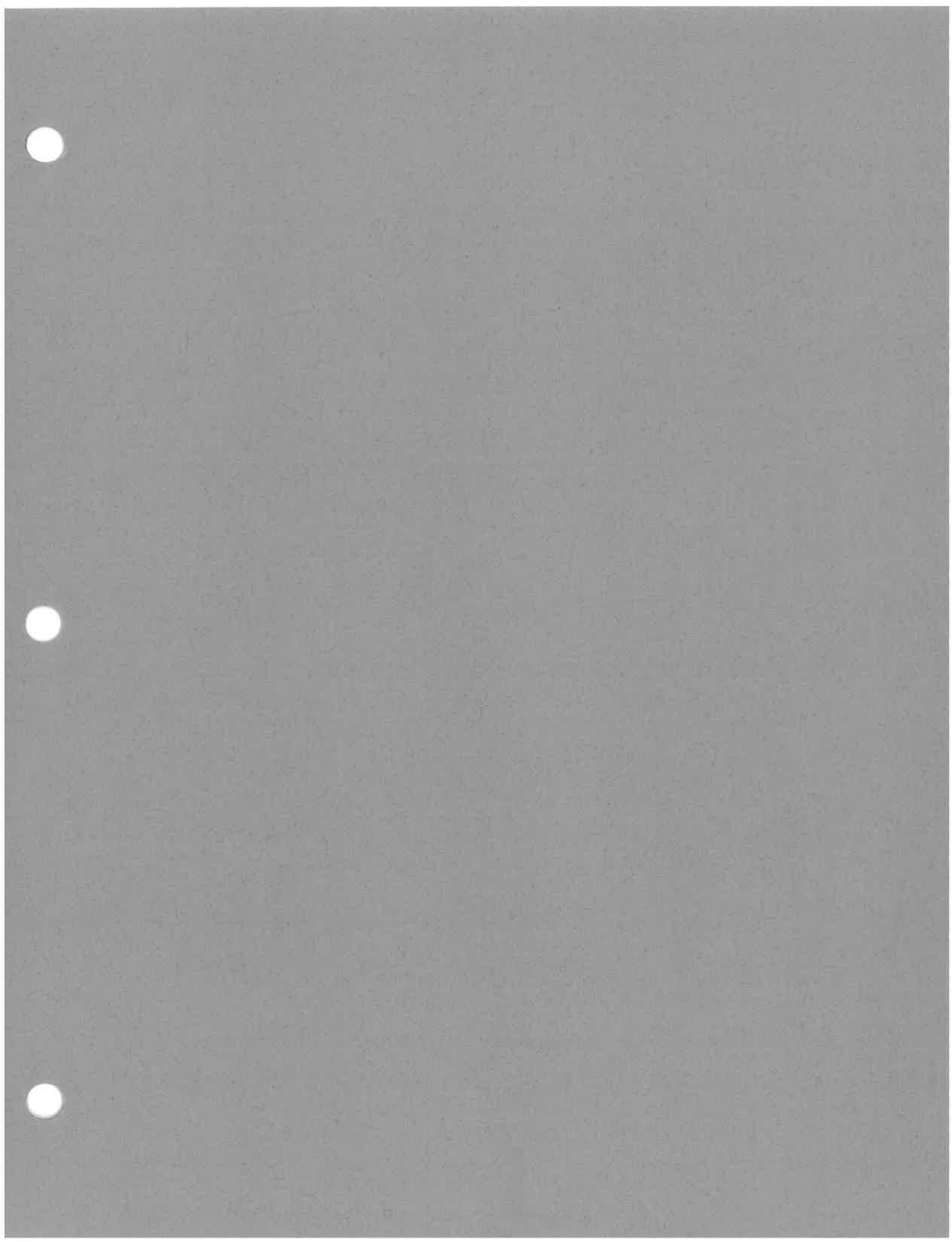


MONTGOMERY COUNTY FIRE AND RESCUE SERVICE DRIVER/OPERATOR TRAINING PROGRAM

TRAINING SUPPLEMENT EMS Transport Unit

The following is a list of reference materials to facilitate the completion of the Training Competencies for the EMS Transport Unit.

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Emergency Vehicle Inspection, Preparation, and Driving Techniques

INTRODUCTION

The intent of this portion of the manual is to provide the candidate with the information needed to safely and efficiently operate emergency apparatus. This section includes but is not limited to vehicle knowledge and inspection, general operation and safety features of the vehicle, and proper driving techniques in normal as well as emergency operations.

The candidate must be completely knowledgeable in all aspects of the vehicle they intend to operate. It is important the candidate is able to demonstrate safe driving habits and is fully knowledgeable of the safety features inherent to the vehicle. The candidate shall be able to identify the various components of the vehicle and explain their use. The candidate will be able to identify any defects, make minor repairs, and understand when the vehicle is to be placed out of service due to safety reasons or major defects. In turn the candidate will be able to complete the necessary documentation required by the Department.

OBJECTIVES

Upon completing this module of the Driver Training Manual, the candidate will be able to correctly identify, maintain, evaluate, adjust, and operate an emergency vehicle. This will involve: being able to identify major components of an emergency vehicle and being able to prepare the vehicle for an emergency response. These operations will include - preventive maintenance, pre-response preparation, safety checks and adjustment. The candidate will know, understand, and successfully demonstrate safe and correct handling of the vehicle in routine, emergency, and dangerous driving situations.

VEHICLE INSPECTION AND DRIVING PREPARATION

Major Motor Vehicle Components

There are many motor vehicle components to be discussed when describing any motor vehicle and some are specifically associated with emergency vehicles. The following is a list of components covered in this section:

- Vehicle characteristics – height, weight, length, and width
- Motor / engine components
- Braking systems: drum, disc, air, ABS, and engine retarders
- Exhaust systems
- Driveline
- Steering system
- Electrical system
- Suspension
- Wheels and tires

VEHICLE CHARACTERISTICS

The characteristic of an emergency vehicle affects the impact on the physical forces of the vehicle. The **height, weight, length, and width** of the vehicle are those items that are going to affect to the action and reaction of the vehicle while it is in motion. These items limit the direction of travel of the vehicle due to weight limitations (bridges), height constraints (overpasses), and width restrictions (tunnels).

Height: It is important to know the *overall* height of the vehicle including all lights and other equipment mounted on the top of the vehicle. The operator should be able to recognize not only structural overhangs but also other potential problems, for example tree limbs, power and phone lines, and any other low hanging objects. It is also important to understand the vehicle height plays a roll in how the vehicle is going to handle in terms of braking and turning. The taller the vehicle is the higher the center of gravity. This is important when making turns. Because the center of gravity is higher, the potential for rollover is higher if the vehicle is exceeding a safe turning speed. This higher center of gravity changes the braking on the vehicle as well.

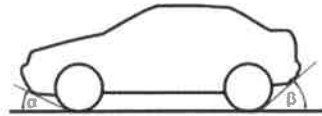
Weight: The gross vehicle weight rating (GVWR) is the maximum operating weight specified by the vehicle manufacturer including the vehicle itself, fluids, accessories, passengers, and cargo. The GVWR is vital to know because of posted weight limits on bridges, overpasses, roadways, and parking areas. All publicly maintained roads have a safety factor designed into the road bed or supporting structures, however privately maintained facilities are unpredictable.

Where a weight limit is posted on a public roadway it can be assumed that the actual designed weight limit is higher. Before entering an area with weight limit restrictions, consider the GVWR of your apparatus compared to the weight limit, the apparent condition of the roadway or bridge, and whether you will be simply passing across the surface or parking on it. When apparatus weight exceeds posted limits, consider another route. Knowledge of territory is key to avoiding these situations.

As with height, the weight of the vehicle influences vehicle handling. The weight of the vehicle has a direct impact on the braking system. The weight distribution between the front and rear axle must be appropriately distributed. The vehicle should have approximately 1/3 the weight over the front axle and 2/3 of the weight over the rear axle. Additionally the weight should be distributed evenly from side to side. Personnel, equipment, and accessories must be placed on the apparatus in a way that avoids overloading components of the vehicle. When weight is distributed correctly the braking, suspension, and steering systems will work as designed.

Another term to be familiar with is "curb weight". The curb weight of a vehicle is the weight of the vehicle with all of the standard equipment and amenities, but without any passengers, cargo or any other separately loaded items in it. For fire apparatus, this is essentially the weight of the vehicle when it is brand new and leaving the manufacturing plant.

Length: The length of the vehicle is a primary factor in turning radius (wheel base contingent) and angle of approach and angle of departure. It is safe to assume that the longer the vehicle the larger the turning radius must be. The angle of approach and departure are important when moving across changes in grade. Angle of approach and departure are the angles made between the road surface and a line drawn from the point of ground contact and either the front or rear of the tire to any projection of the apparatus. This is important so that the front or rear bumpers or any object of the undercarriage of the vehicle does not come into contact with the road surface.



Angle of Approach and Departure

Width: The width of the vehicle comes into play when driving into diminished clearance environments. It is important that the width of the vehicle is the *overall* width that includes mirrors and any piece of equipment mounted to the exterior of the vehicle. Public roadways have lanes varying from 9 to 12 feet wide.

MOTOR/ENGINE COMPONENTS

There are two types of engines, gasoline and diesel. Their components are very similar in nature. The primary concern to the operator is the type of fuel used by the engine. Care should be taken to ensure the proper fuel is used. The

following is a list of the basic components in the motor compartment of the vehicle.

Engine Block: The engine block is where the pistons perform the work to create the motion of the vehicle. The block becomes extremely hot during the operation of the vehicle. Oil and antifreeze pass through the block during its operation.

Radiator: The radiator contains the fluid used to keep the engine block from overheating. The cooling system is a closed system working under a vacuum.
**** NOTE **** The fluid in this system becomes extremely hot and should not be handled until cooled.

Battery(s): The batteries are the storage area of the electrical system. They are used when starting the vehicle and maintain steady current to electrical components during the operation. Most ambulances have four 12-volt batteries wired in parallel; larger apparatus may have six or more. Older apparatus have a selector switch to opt for either or both batteries. The switch indicates which battery is being charged. Generally, the switch needs to be in the “both” position when starting and running the vehicle. Never turn off the battery switch while the engine is running. This will cause damage to the alternator and electrical system. If the batteries need to be charged, only charge one at a time, and not both, on the selector switch. Charging both could cause one battery to receive an excessive charge, causing the contents to boil, resulting in battery damage or destruction. **** NOTE **** The battery (s) contain acid which will harm you if you come in contact with it.

Power Steering Pump: The power steering pump pressurizes the fluid used to assist in steering the vehicle. The fluid in this system is stored in a reservoir and can be checked either while the engine is cold or hot. There are differentiating indicator marks on the dipstick for this purpose.

Brake Master Cylinder: The fluid for a hydraulic brake system is contained in the brake master cylinder. Most are translucent so the fluid level can be checked without removing the caps. It is important that no contaminants enter the brake system, therefore it is best not to remove the caps. If brake fluid is found low, consult with CMF prior to adding any fluid.

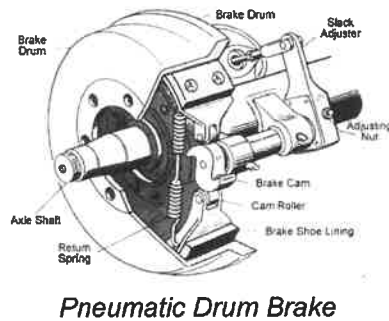
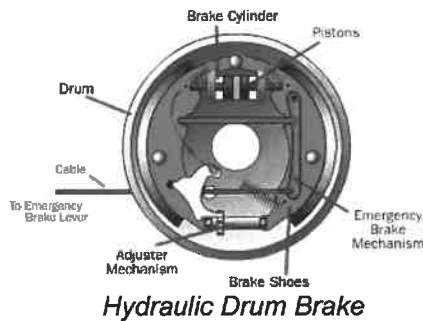
Fan/Accessory Belts: These belts are used to power various motor accessories, such as the cooling fan for the radiator, alternator, and air conditioning compressor.

BRAKING SYSTEMS

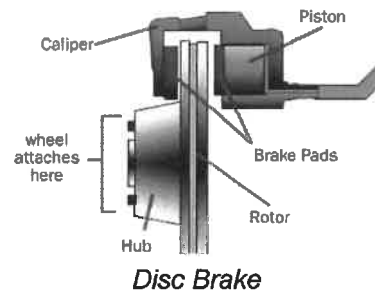
A vehicle's braking system converts inputs from the brake pedal or parking brake controls in the cab to the friction devices (brakes) located at each vehicle wheel.

Systems on MCFRS apparatus either use liquid or air to create the forces to engage the friction devices. Liquid systems are known as hydraulic.

There are generally two types of friction devices used to slow or stop vehicles, *drum* or *disc* brakes. *Drum* brakes contain two brake shoes that create friction when pushed outward against a surrounding drum. The drum is attached, and rotates with, the wheel. Pressure on the brake pedal causes fluid or air to actuate a cylinder at the wheel. The cylinder then moves the brake shoes outward against the brake drum to create friction. The friction of the shoe against the drum causes the wheel to slow or stop.



Disc brakes are comprised of brake pads and a caliper that squeeze the rotor to stop the vehicle. The rotor is a disc that is attached to the wheel axle. When the brake pedal is depressed, a piston in the caliper causes the caliper to squeeze together, bringing a pair of brake shoes into contact with the rotor. The friction of the opposing brake pads as they squeeze the rotor slows the rotor rotation and causes the wheel to slow and stop.



Air brakes use compressed air to control the application of the brakes. An air brake system is comprised of three primary parts: service brake, parking brake, and emergency brake systems.

- The *service brake* system applies and releases the brakes when you depress the brake pedal during normal driving operations.
- The *parking brake* system applies and releases the parking brakes when you use the parking brake control.
- The *emergency brake* system uses parts of the service and the parking brake systems to stop the vehicle in the event of a brake system failure.

There are many individual components of the air brake systems. The following are some major parts of the system:

Air compressor – The air compressor pumps air into the air storage tanks. The compressor is connected to the engine through gears or a V-line belt. The compressor may be air or oil cooled.

Air Compressor Governor – The governor controls when the air compressor will pump air into the air storage tanks. When the air tank pressure rises to a preset level (around 125 psi) the governor stops the compressor. When the tank pressure falls below a preset level (around 100 psi) the governor allows the compressor to start pumping again.

Air Storage Tank – Air storage tanks are used to hold the compressed air. The number and the size of the tank(s) depend on the size of the vehicle and any auxiliary functions that draw air from the system. The tanks hold enough air for the service brakes to be used several times even if the compressor fails to automatically replenish the air. All air has a certain level of humidity which means that there is always water vapor in the atmosphere. Air is heated as it's compressed, and it cools as it travels through the discharge line to the air storage tank. This cooling results in condensation creating pools of water in the bottom of the air tanks. Oil from the compressor and any contaminants that made it through the compressor's air filter can also be in the water. This moisture can lead to blockages or malfunctions if the the water freezes. It can also lead to corrosion or reduce capacity in the storage tanks. Since the moisture tends to collect at the bottom of the air storage tanks each tank has a method of draining or bleeding the tank. Tanks can have either a stopcock valve that requires turning to open or a spring-loaded stopcock that is opened by pulling on a cable that is usually reachable without climbing under the vehicle. ****NOTE**** It is important to remember that once the tanks have been bled the system must be recharged prior to moving the vehicle.

Most fire service vehicles also have an automatic air dryer installed between the air compressor and storage tanks. Their purpose is to filter out water vapor, oil vapor, and other contaminants before they can reach the air tanks and valves. This helps prevent freeze-up during the winter and extends the life of air valves.

Safety Valve – A safety valve is installed in the first air tank the air compressor pumps air to. This valve protects the tank and the rest of the system from being over pressurized. This valve is usually set to release at 150 psi. ****NOTE**** If this safety valve releases air there is a problem that a mechanic should be notified immediately.

Brake Pedal – To apply the brakes you press down on the brake pedal. Pushing the pedal down harder applies more air pressure. Letting up on the brake pedal reduces the air pressure and releases the brakes. Releasing the brakes lets some of the compressed air to go out of the system, so the air pressure in the tanks is reduced. Pressing and releasing the pedal unnecessarily can let air out faster than the compressor can replace it. If the pressure gets too low the brakes will not work.

Foundation Brakes – Foundation brakes are used at each wheel. The most common type is the S-cam drum brake. The following is the break down of the brake parts:

- **Brake drums, shoes, and linings** – Brake drums are located on each end of the vehicles axles. The wheels are bolted to the drums and the

braking mechanism is inside the drum. To stop, the brake shoes and linings are pushed against the inside of the drum. This causes friction, which slows the vehicle (and creates heat). The heat a drum can take without damage depends on how hard and how long the brakes are used. Too much heat can make the brakes stop working.

- **S-cam Brakes** – When you push the brake pedal, air is let into each brake chamber. Air pressure pushes the rod out, moving the slack adjuster, thus twisting the brake camshaft. This turns the S-cam (named because of its S design). The S-cam forces the brake shoes away from one another and presses them against the inside of the brake drum. When you release the brake pedal, the S-cam rotates back and a spring pulls the brake shoes away from the drum, letting the wheels roll freely again.
- **Wedge Brakes** – In this type of brake, the brake chamber push rod pushes a wedge directly between the ends of the two break shoes. This shoves them apart and against the inside of the brake drum. Wedge brakes may have a single brake chamber, or two brake chambers, pushing wedges in at both ends of the brake shoes. Wedge type brakes may be self-adjusting or may require manual adjustment.
- **Disc Brakes** – In air-operated disc brakes, air pressure acts on a brake chamber and slack adjuster, like S-cam brakes. But instead of the S-cam, a “power screw” is used. The pressure of the brake chamber on the slack adjuster turns the power screw. The power screw clamps the disc or rotor between the brake lining pads of a caliper, similar to a large C-clamp.

Supply Pressure Gauge(s) – All air-brake vehicles have a pressure gauge connected to the air tank. If the vehicle has a dual air brake system, there will be a gauge for each half of the system. (Or a single gauge with two needles). These gauges let you know how much pressure is in the tanks.

Low Air Pressure Warning – A low pressure warning signal is required on all vehicles with air brakes. A warning signal you can see must come on before the air pressure in the air tanks falls below 60 psi. The warning is usually a red light and on some vehicles a warning buzzer sounds as well.

Stop Light Switch – Drivers behind you must be warned when you put your brakes on. The air brake system does this with an electric switch that works by air pressure. The switch turns on the brake lights when you are applying the brakes.

Spring Brakes – All vehicles must be equipped with emergency brakes and parking brakes. They must be held on by mechanical force (because air pressure may leak out). Spring brakes are used to meet these needs. When driving powerful springs are held back by air pressure. If the air pressure is removed, the springs put on the brakes. A parking brake control in the cab allows the driver to let the air out of the spring brakes. This lets the spring brakes on. A leak in the air brake system, which causes all the air to be lost, will also cause the springs to put on the brakes.

Parking Brake Controls – In most vehicles, you apply the parking brakes using a *diamond-shaped, yellow, pull-push control knob*. You pull the knob out to put the parking brakes on (spring brakes), and you push it in to release them.

****NOTE**** Never push the brake pedal down when the spring brakes are on. The combined forces of the springs and the air pressure could damage the brakes.

Apparatus equipped with air brakes use two methods for parking brakes. First is a driveline brake, which is an actual disc or drum that attaches to the drive shaft and is operated by cables or levers. The second type is a spring-activated brake atop a service brake chamber that automatically applies the brake when the air pressure drops below a preset pressure.

It is important to define what a *Dual Air Brake System* is. Most new vehicles use a dual air brake system for safety reasons. A dual air brake system has two separate air brake systems that use a single set of brake controls. Each system has its own tanks, hoses, and lines, etc. One system typically operates the regular brakes on the rear axle(s). The other system operates the regular brakes on the front axle. The first system is called the primary and the other called the secondary system.

Many vehicles are equipped with *Antilock Braking Systems (ABS)*. The purpose of the *ABS* is to permit the driver of the vehicle to stop the vehicle in the shortest possible distance while maintaining full control. By preventing the wheels from locking, *ABS* helps to improve control and stability. *ABS* allows steering during braking applications, and in most instances, reduces stopping distances, especially on wet, icy, or loose gravel surfaces. *ABS* use sensors at each of the wheels to send wheel speed information to a central computer. When the computer senses that a wheel is about to lock up, it automatically “pumps” the brakes on that wheel.

Due to the size and weight of today's apparatus, secondary or auxiliary braking systems have been added to increase the braking capabilities of the vehicles.

Essentially there are three (3) types of auxiliary braking systems:

- Engine Brake
- Automatic Transmission Retarder
- Driveline Retarder

The engine brake is known as a compression brake, or by the trade name “Jake Brake”. The brake mechanism uses the “compression” that the engine creates to slow the vehicle down. Essentially the system is allowing more new air into the cylinders of the engine causing it to work or bear down harder creating less horsepower and a force. The engine brake customarily comes with a selection switch allowing the driver to decide on the amount of work the braking system should do (2 cyl, 4 cyl, 6 cyl) or high or low. It should be noted that engine brakes on vehicles with automatic transmission are typically not effective below 20 miles per hour (mph) due to the low rpm's of the engine while operating at low speeds.

****NOTE**** Most manufacturers recommend the engine brake be turned off or placed in a lower mode during inclement weather or slippery road conditions.

The *automatic transmission retarder* is attached to the transmission either on either end of the transmission. The input retarder operates on the input end and the output retarder, which is the most prevalent on fire service apparatus, is attached to the output end of the transmission. The retarder system is self-contained and consists of a vaned rotor, which rotates in a vaned cavity. The rotor is splined to and driven by the output shaft. An external accumulator holds transmission fluid until the retarder is activated. When activated, the fluid in the accumulator is pressurized and directed into the retarder cavity. The interaction of fluid with the rotating and stationary vanes causes the retarder rotor speed, and hence the output shaft, to decrease and slow the vehicle. ****NOTE**** Most manufacturers recommend the retarder be turned off during inclement weather or slippery road conditions.

The *driveline retarder* can be divided into 2 types, hydraulic and electromagnetic. Both types are attached to the driveshaft between the transmission and the rear axle. The hydraulic type absorbs energy by pumping oil around the driveshaft slowing the vehicle down. The electromagnetic retarder sets up a magnetic field that grabs the driveline. The absorbed energy is transferred to the surrounding atmosphere as heat. ****NOTE**** Most manufacturers recommend the retarder be turned off during inclement weather or slippery road conditions.

EXHAUST SYSTEMS

Vehicle exhaust systems have grown increasingly complicated as emission control standards have increased. Since 2007 most diesel engines are equipped with "aftertreatment" systems integral to the exhaust system. For the apparatus operator, there are two primary areas of concern that impact vehicles equipped with these systems; the Diesel Exhaust Fluid (DEF) and the Diesel Particulate Filter (DPF). Both the DEF and DPF are included in the instrument panel light cluster to alert the driver to the system status.

DEF is a non-hazardous solution of 32.5% urea and 67.5% de-ionized water used in post-2009 diesel vehicles. DEF is sprayed into the exhaust stream of diesel vehicles to break down nitrogen oxide emissions into nitrogen and water. DEF is **not a fuel additive** and never comes into contact with diesel. It is stored in a separate tank, typically with a blue filler cap.

The DEF tank is separate from the diesel fuel tank and should be refilled only when it reaches half. There is no need to continuously top off the DEF tank. The DEF level indicator is generally located immediately adjacent to the diesel fuel level indicator on the dashboard. **DO NOT** allow the DEF tank to reach empty or the vehicle will automatically reduce power.



CMF stocks DEF in 2.5 gallon containers with filler tubes. DEF may also be found in bulk at certain fire stations. DEF may be requested as needed

through normal supply procedures.

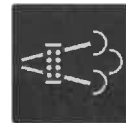
DEF crystallizes when stored for prolonged periods as the water evaporates. Do not use DEF that shows signs of crystallization and always completely use a container to avoid storing opened containers.

Use the filler tube supplied with the case to avoid spills or splashes. Spills can be safely washed down with water. DEF is not corrosive to human skin, however is corrosive to aluminum. Do not allow it to remain on the diamond tread.

The freezing point of DEF is 12°F, however vehicles are equipped to thaw the DEF and this should not restrict use of the vehicle.

Personal protective equipment is not necessary when handling DEF, however it will stain clothes.

The DPF indicator illuminates when sufficient particulate has accumulated in the system to require regeneration. Regeneration occurs in one of two modes; automatically when the vehicle is at highway speeds for in excess of 20 minutes or while parked. Parked regeneration is most likely the mode required simply due to the type of driving done by fire apparatus. Personnel must refer to the manufacturer's instructions for the breed of apparatus for specific instructions on conducting regeneration.



Beyond the emissions control features, the exhaust system is basic and is comprised of a muffler or mufflers, exhaust pipes, tail pipes, and or vertical stacks. It is important to note that a faulty exhaust system affects the performance of the motor and can emit poisonous fumes into the crew area causing serious illness.

DRIVELINE

The driveline consists of the transmission, front universal joint, driveshaft, rear universal joint, differential, and the rear axle. The transmission is a system of gears that allows change in the ratio of the number of engine revolutions to the number of wheel revolutions. The drive shaft connects to the rear of the transmission and is powered to turn the differential. The differential is a component of the rear axle that the rear wheels are attached to. The entire system works in unison to rotate the rear wheels.

Locking Differential

Vehicles may be equipped with a locking differential that is engaged by a switch on the dashboard. A locking differential temporarily divides torque from the driveline to be delivered equally to all wheels sharing an axle, regardless of their traction. The drive wheels will act like they are rotating on a common shaft. One wheel that finds good traction will keep the truck moving. Without a locking differential, the wheels without traction may continue to spin with little torque being sent to the wheels with traction.

- ✓ Never engage the differential lock above 25mph or while the wheels are spinning
- ✓ When engaged, steering radius will increase dramatically
- ✓ Disengage once the vehicle is freely moving—do not drive on dry pavement with the lock engaged or damage may occur to tires or axle components
- ✓ When tire chains are installed, do not attempt to turn the vehicle with the lock engaged.

Inter-Axle Differential Lock (tandem axle chassis)

The inter-axle differential in a tandem axle chassis provides for necessary differential action between the axles. This allows the wheels of either axle to revolve faster or slower than the wheels of the other axle in order to compensate for cornering, uneven road surfaces, and slightly different tire sizes. When encountering soft or slippery road conditions, the inter-axle differential can be locked out, eliminating any differential action between the axles.

- ✓ Engage the IAD lock only when stopped or moving at slow speed. NEVER lock the IAD lock with the rear wheels spinning.
- ✓ Disengage once the vehicle is freely moving—do not drive on dry pavement with the lock engaged.

There are two types of transmissions: standard and automatic. The standard or manual transmission uses a clutch assembly to shift the transmission gears depending on the RPMs of the motor and the desired speed requested. Computer modules control the automatic transmissions. The modules signal and influence the engines RPMs during transitional shifting.

STEERING SYSTEM

The steering wheel and column connect to steer the vehicle. They connect to a gear and linkage mechanism that changes the direction of the front wheels. In most vehicles this either “power assist” or “power steering” to ease the turning of the steering wheel. These are both hydraulic (fluid) driven systems.

ELECTRICAL SYSTEMS

The electrical system supplies power for primary and auxiliary functions. The primary functions of the electrical system include: power the generator and storage battery, generator/alternator, and voltage regulators; power distribution (via engine wiring); timing (distributor); and spark generation if equipped. Auxiliary functions include: inside/outside lighting (headlights; amber, red signaling or warning lights; turn signals; instrument panel lights; etc.); and horn, siren, and public address system.

SUSPENSION

This system is comprised of leaf springs, shock absorbers/coils, air rides, and wheels, and tires that enable the driver to handle the vehicle properly on rough terrain and sharp curves.

WHEELS AND TIRES

As mentioned before the wheels and tires are a part of the suspension system; however, it's important to define them a bit more. Both wheels and tires must have a weight rating which will accommodate the weight distributed through the axle and springs. The condition of the tires is based on inflation, tread design, and tread wear. All of these have a major impact on vehicle handling. Each tire has only about 40 square inches of contact with the road. It is imperative that both the inflation pressure and tread be in good condition to provide maximum safety. The minimum recommended tread depth for emergency vehicles is 4/32 inches for front tires and 2/32 inches for rear tires.

Automatic Traction Control

To aid the tires in maintaining traction, apparatus may be equipped with an automatic traction control function. This system monitors wheel speeds and automatically applies braking to a drive wheel that is spinning. In extreme situations, engine speed may also be decreased until traction is achieved leaving the driver unable to accelerate. If it is desirable to rock the vehicle when stuck and the automatic traction control is cutting the throttle, engage the "mud and snow" switch or other override control provided by the chassis manufacturer.

EMERGENCY VEHICLE PRE-RESPONSE PREVENTIVE INSPECTIONS

Emergency vehicles of all types should be inspected prior to and again within 24 hours after being used for an emergency response. Emergency vehicle accidents caused by the lack of maintenance or vehicle malfunction are preventable. Physical and visual inspections must be done on a routine basis. In the final analysis, no matter who performs the actual maintenance on the vehicle, it's the driver's responsibility to confirm the vehicle has been inspected prior to use. The driver *must* verify that the vehicle is in proper operating condition. The responsibility for the mechanical safety of the vehicle is that of the driver. *IF IT ISN'T RIGHT, DON'T DRIVE IT.* The purpose of the pre-response preventive maintenance inspection is two fold – identify and correct unsafe conditions.

Inspection guidelines are broken down into nine (9) core areas to expedite the inspection process.

- Check prior maintenance records
- Conduct a vehicle overview
- Conduct an engine compartment check
- Conduct an interior cab check
- Conduct a vehicle walk around check
- Conduct a compartment and equipment check
- Conduct an undercarriage check
- Conduct a moving and driving test
- Complete inspection process

All inspections, maintenance, and repairs must be recorded by the Department. The records must include the date and description of all maintenance, repairs, and inspections performed. The following is a break down of the nine categories listed above:

Check PM Records - Each day the records of the previous days should be reviewed for defects and repairs.

Vehicle Overview – Conduct a vehicle overview including inspecting for body damage and cleanliness; and leveling of the vehicle (indicates suspension problems).

Engine Compartment – Conduct an engine compartment check with the engine off. You should check the following:

- Oil levels
- Coolant levels
- Power steering fluid level
- Transmission fluid level
- Air compression belts
- Hydraulic reservoir
- Brake fluid level
- Battery fluids both left and right
- Windshield washer fluid levels
- Belts and wiring harnesses
- Steering box not leaking
- Safety devices including hood latches and safety bars for tilt cabs

Interior Cab – Conduct an interior cab check by first properly preparing for the vehicle inspection:

- Engage the parking brake, chock the wheels, turn the batteries on, turn on the ignition master, place gears in neutral, and start the engine.
- Check the instrument/dash gauges for operating voltages, temperatures, pressures, and levels.
- Check the accelerator pedal padding, in place and not loose.
- Engage and disengage emergency air brake system.

- Conduct air/hydraulic brake test and listen for obvious leaks, and/or blown diaphragms.
- Check steering wheel and column for centering, excessive play (greater than 10 degrees), and abnormal movement.
- Check electric/air horns for equal tone quality from each horn and blown diaphragm for moisture or oil on the windshield of the horn.
- Check electronic and mechanical sirens for excessive draw on ammeter and voltage fluctuations and electrical system problems.
- Check windshield wipers and washers as well as heating and defrosting systems.
- Transmission controls, such as the clutch catch or friction point, should be checked to ensure there is no hang up or binding and that it does not jump out of gear.
- Check radio equipment including fixed, portable, public address system, and cellular phone.
- Interior lighting systems in the cab and crew compartments should be checked to ensure they are working properly.
- Mechanisms for the seat adjustment, both mechanical and pneumatic, should be checked to ensure they are working properly.
- Check seatbelt (occupant restraints) systems.
- Check the interaxle differential locking systems, both dual and tandem axle.
- Check warning lights and buzzers systems, including oil, water, and transmission fluid level and temperature and open door compartment warning lights.
- Ensure outside mirrors, both manual and mechanical, can be adjusted and the wiring for the heating system is intact and operational.
- There should be the appropriate maps and accountability rings/systems on board.
- Internal communication devices and equipment (David Clark Systems) should be checked.
- Check the fast idle RPMs to ensure that it can maintain the electrical system.
- Check emergency lighting.

Vehicle Walk Around – Conduct a vehicle walk around and operate and/or check the following:

- Windshield and windows for any cracks that may necessitate taking the vehicle out of service.
- Check headlights, both low and high beams and four way flashers.
- Check the strobe lights and all the emergency vehicle-warning lights.
- Light bars, rotating lights, and/or oscillating lights should be checked.
- Check side markers and reflectors.
- Check turn signals.

- With assistance, check to make sure all the brake lights are operational.
- Check flood light systems.
- On the tires and wheels, check for obvious gouges, slashes, cuts, bubbles, or any other damage. Make sure they are the proper size and are not mismatched. Look for indications of rust or peeling paint on non-aluminum rims. Check the condition of the lug nuts and wheel hubs. Check for any grease leaks. Inspect the rims for damage and missing weights. Make sure the tire pressure is correct and the valve stems are intact with caps. The depth of the tread should be 4/32" in the front and 2/32" in the rear.
- Check the auto chain systems for the rear wheel to make sure they function properly.
- The undercarriage should be checked for any obvious fluid leaks in the engine area (note the color of the fluid leaking).

Compartment Check – Conduct the compartment and equipment check:

- Make sure the compartment latching mechanisms work properly.
- Compartment equipment must match the inventory and are in its proper place.
- Make sure the circuit breakers are working properly.
- Ensure there are sufficient warning devices such as cones, flares, and reflective triangles on board.
- Fire extinguisher is on board and fully charged.
- Check for appropriate documentation (accident reports, vehicle registration etc.)
- Crew equipment should include SCBA, hand lights, AED, EMS, as the basic, should be checked to ensure they are in working order.
- Ensure all other equipment is working properly.

Undercarriage – Conduct an undercarriage check:

- On the undercarriage bleed the moisture from the air tanks as required to check the color of the fluid being emitted – light gray sludge indicates a bad compressor: leaks from system ****NOTE**** Moisture should be bled from tanks frequently during inclement weather and temperature fluctuations. The brake lines should be checked for cracks, fraying, dry rot, pulling or distortion, or wear marks. ****NOTE**** Check slack adjusters for excessive movement, not more than 1 inch, and whether they are frozen in place. Do not attempt to make slack adjustments; trained personnel should conduct the adjustments.
- The driveline (engine to differential/rear axle) should be properly greased, make sure there is no excessive movement in the joints, and the dust covers are intact.
- Check the exhaust system for soot, black smoke, clamps and hangers, and any pitting on the underside.

- On the suspension system, mechanical or pneumatic, check the leaf springs for cracks and breaks, shackles and hangers, shock towers, and leaks and air leaks (shocks or bags).
- Make sure the automatic chain systems are securely attached and lined up properly.
- Look for obvious damage, such as rust, loose parts, shiny spots, asymmetrical parts (out of alignment), any cracks in the frame rails, and shifting body mounts.
- The inner sides of wheels and tires/ sidewalls on the tires should be checked for excessive dusting, fluid leaks, bad seals, and cracked brake drums and shoes.
- The wiring harness should be checked for frayed or cut wire.
- Check the fuel tank for obvious leaks that straps and grounding pad are intact, fuel lines are ok, and the overflow is not kinked.
- Check for leaks of any fluids and if there is, their point of origin, either the transmission, rear end, or plugs, vents or right side or rear axle. Do not paint over any of these areas.

Brake Test/Air Brakes – For vehicles equipped with service air brake systems, conduct a DOT Brake Test. Reference the Practical Application Guide Sheet for Pre-Trip Air Brake Check. Note: this test is ONLY to be used on apparatus with air brakes. Some EMS Units are equipped with hydraulic brake systems.

Complete Inspection Process – Document the pre-response inspection and compare it to the previous report. Follow-up on discrepancies noted. If discrepancies are noted that influence on function, operational/directional ability, and/or safety, place the unit out-of-service and consult with the appropriate maintenance personnel before placing the unit back in service for responses.

ROUTINE MAINTENANCE ON EMERGENCY VEHICLES

Operator safety is dependant on the vehicle condition. Well-maintained vehicles have fewer malfunctions and are easier to control. The Department must identify the role of the emergency driver in the inspection and maintenance program. Routine maintenance of the vehicle is the responsibility of the driver. The Department should maintain checklists for these types of inspections and routine maintenance functions. Deficiencies should be repaired or reported in writing to the individual responsible for the maintenance. The role of the emergency driver as it pertains to preventive and routine maintenance is defined in NFPA Standard 1002, Fire Department Vehicle Driver/Operator Professional Standards. Applicable, with minor adjustments, to all emergency vehicles the standards states:

“... Prior to operating fire department vehicles the fire apparatus operator **shall** meet the job performance requirements as defined in ...”

As this relates to the preventative maintenance function, it specifically states that the driver shall be able to “perform routine tests, inspections, and servicing functions on the specified systems and components and ... so that the operational status of the vehicle is verified.”

The systems and components identified in NFPA 1002 are listed here. Items for consideration under each are identified as reference:

Batteries:

- Connections of the cables are clean and tight
- Battery box/compartment is clean and secure

Braking System:

- Air Brakes
 - Pressure prior to starting the engine (air) should be approximately 125 psi;
 - Build-up time, if appropriate (air), when the engine is operating at normal RPMs, the pressure should build from 85 psi to 100 psi within 45 seconds in dual air systems. In single air systems, pressure should build up from 50 to 90 psi within 3 minutes when operating at normal RPMs.
 - Moisture in system/drain air tanks, in tanks with manual bleed valves, turn the valve ¼ turn to drain air, moisture, and dirt from system. Return valve to closed position to build up air in system again
- Hydraulic Brakes
 - Proper fluid level in the master cylinder
 - No signs of leaks or damaged lines
- ABS verification (dash light)
- Braking Operation (during runs as well as at inspection time)
- Brake pedal (proper range of motion)

Coolant System:

- Correct level (generally approximately 2 inches below the top of the radiator, check with local requirements)
- Hose and/or connections wear/leaks

Electrical System:

- Ensure all lights and audio equipment is operational, if bulbs need to be replaced make sure the correct bulb size and style is used and replace faulty fuse in audio system if needed.
- Voltmeter should be reading between 12 and 14 volts

Fuel:

- If not above ¾ full, fill tank with proper type of fuel

Lubrication:

- Check for leaks on the floor of grease droppings
- Ensure there is not grease thrown in the engine compartment or body

Oil (Motor):

- Leaks on the floor under the vehicle
- Check levels using the dipstick in the engine compartment
 - Checked when the engine is cool or cold
 - Engine is warm or hot the oil is dispersed throughout the engine
 - Allow 20 to 30 minutes for oil to settle back into the oil pan after the motor is run
- The color and texture of the oil on the dipstick should be noted. If the oil is frothy (bubbly) or a color other than dark brown or black, there may be water or fuel infiltrating the oil that is indicative of a motor problem.

Tires:

- Condition (sidewalls, rims, tread)
- Correct inflation pressure, fill as needed to the rated pressure for that tire

Steering System:

- Ease of operation (power OK and no extra play)
- Correct fluid level, this may be checked while the engine is hot or cold and the fluid level should correspond to that on the dipstick

SAFETY CHECKS AND ADJUSTMENTS MADE BEFORE DRIVING

There are certain items that should be checked by the driver prior to moving the vehicle:

Occupant Restraint Systems – Restraints reduce the likelihood of serious injury or death in the event of an accident. The law requires that there be a restraint for all riders and that they be used any and all times the vehicle is in motion. The restraints keep the driver in position behind the wheel and in front of the controls during sharp turns, over excessive maneuvers, roll overs, and yaw skidding or spins.

Adjustable Head Restraints – Head restraints help prevent cervical spine and other injuries from hyperextension and hyperflexion; ie. forces resulting from rear end collisions. The proper adjustment for the head restraints is to have the center of the restraint at the center of the skull not at the base of the neck. If the restraint is too low, the neck could be broken if force of impact is great.

Seat Position – When the seat is properly adjusted, the brake and accelerator can be applied fully without fully extending the leg. The steering can be held with only a slight bend at the elbows. The seat should be fully locked into position. If the seat was to move during operation, it could cause the driver to lose control.

Mirrors – The side-view mirrors should be adjusted to view the edge of the vehicle and out to the adjoining lanes. Convex mirrors need to be adjusted to view the blind spots that the side-view mirrors do not cover. In large vehicles the convex mirrors are invaluable for managing lane position and expanding your view around the vehicle.

PRECAUTIONS BEFORE MOVING

The driver controls the movement of the vehicle; therefore the driver must verify when passengers are ready. Prior to moving the vehicle audible or visual communication is necessary with all crew members confirming that they are belted and ready. Prior to moving, ensure the bay door is fully opened and/or the wheel chock is stowed, all compartments and cab doors are closed, and there are no obstacles in the path of the vehicle. If you are dispatched to a call in the midst of training or daily checkout, it is especially important to ensure the crew, equipment, and apparatus are all ready for departure. Do not sacrifice a quick check of the apparatus for the sake of speed.

OPERATING AN EMERGENCY VEHICLE

Purpose of Emergency Vehicle Signaling Equipment

Lights and sirens (Emergency Vehicle Signaling Devices) are used to request the right of way from traffic, both vehicular and pedestrian. Warning and signaling equipment assist the responders with arriving at an incident expeditiously. Due regard **MUST** always be exercised, regardless of the perceived severity of the emergency.

Local Law (Maryland)

In order to request the right-of-way and enact the exemptions provided to emergency vehicles, Maryland law requires an emergency vehicle operator to use both audible and visual emergency warning devices while responding to an emergency. You may not be protected from consequences should you choose to run "silent" with only warning lights engaged. It is important to remember use of signaling equipment by the operator **DOES NOT** guarantee other drivers will yield or even see you, nor does it free the driver from the possibility of civil or criminal liability if a collision does occur.

To better understand the liability and responsibility of the driver, a few definitions will be discussed. They are as follows:

- **True Emergency** – is defined as a situation in which there is a high probability of death or serious injury to an individual or significant property loss.
- **Due Regard** – for the safety of others means that a reasonably careful person performing similar duties under similar circumstances would act in the same manner.
- **Negligence** – A legal deficiency or wrong that results whenever a person fails to exercise that degree of care that a prudent person would exercise under similar circumstances.

- **Gross Negligence** – Is the reckless disregard of the consequences of an act to another person. It occurs when a person's actions (or lack of) result in the failure to exercise even a slight degree of care.
- **Willful and Wanton** – Intentional or with careless indifference (considered the most serious form of negligence).
- **Vicarious Liability** – The legal liability placed on one person for the acts committed by another person.

Usually a court will judge the actions of an emergency vehicle driver based on two primary considerations:

1. Was the emergency vehicle responding to a **true emergency**?
2. Did the emergency vehicle driver exercise **due regard for the safety of others**?

If the answer to both questions is yes, the emergency driver has demonstrated a responsible and professional attitude through his/her subsequent action(s).

Using Emergency Vehicle Signaling Equipment

An emergency vehicle driver must use all signaling devices when responding. Remember that most emergency vehicles are taller than the average automobile on the road. As you approach another vehicle from behind there are fewer warning lights visible to that driver in their mirrors. Your unit can be so close that only a couple of lights on the grill of your unit are in position to gain their attention. This is another reason to leave a space cushion between you and the vehicles ahead.

Another good practice is to leave the cab windows cracked open to aid with hearing other responding apparatus, trains, and traffic.

BASIC EMERGENCY VEHICLE CONTROL TASKS

Steering, accelerating, and braking accomplish directional and speed control. A competent emergency vehicle driver understands, chooses, and applies each of the basic driving maneuvers in the right combination and intensity at the right moments to effectively and safely operate their apparatus.

Steering – Steering an emergency vehicle, whether driving non-emergency, responding to an emergency, or making an evasive maneuver, requires certain habits. These include:

- Use both hands on the steering wheel as much as possible. Obviously one hand is occasionally required to operate other vehicle functions, such as the windshield wipers, lights, and transmission.

- Maintain hands in the “9 and 3” or “10 and 2” position on the steering wheel for maximum control and turning without repositioning your grip.

Braking and Stopping – Effective braking is essential to the safe operation of an emergency vehicle. Braking must be applied in a timely fashion with the correct intensity to maintain control. Prior to anti-lock braking systems becoming nearly universal, vehicles with hydraulic brakes required firmly pumping the brake pedal during hard stops to avoid the locking of the wheels into a skid. Air brakes do not react well to repeated pumping of the pedal and instead required just enough firm and steady pressure to slow the vehicle without locking the wheels. This was referred to as “threshold” braking because the driver was seeking the threshold between braking and skidding.

Anti-lock braking systems (ABS) change the dynamic of applying pressure to the pedal on both hydraulic and air brake systems. The following guidance applies:

- Do not pump the brake pedal. This only creates confusion for the monitoring system that manages the ABS. Steady pressure to the pedal signals the system that you want to slow down and the system manages the foundation brakes to carry out that action.
- Even vehicles with ABS can skid. If the vehicle’s wheels lock, immediately release the brake pedal and steer with the skid. Reapply the brakes to attempt to establish traction.

In areas where there is a high probability of braking, i.e. passing through an intersection or traveling against traffic; the driver should “cover” the brake by hovering their foot over the brake pedal without applying pressure. This action will reduce the reaction time if braking is required.

The single most important aspect of braking safely is allowing enough space around your vehicle to identify the need to brake and then applying the brakes in a controlled manner. In heavy apparatus when you expand your look ahead distance sufficiently you can often slow and almost stop without even needing to engage the service brakes.

Backing – Backing collisions account for a large portion of preventable emergency vehicle incidents. Since speed is usually low, most backing incidents are relatively minor unless they involve a pedestrian. Regardless of severity, any collision makes the unit unavailable for service for a period of time varying from an hour or two to days. It also results in consequences for the driver and potentially a bad public image for the MCFRS.

Backing apparatus safely is accomplished by adhering to some basic principles:

- Position to minimize the need for backing - If thought is given to the next move or destination for a vehicle, a simple adjustment in the approach can minimize or even eliminate the need for backing.
- Conduct an approach assessment – When approaching the place to back up the driver must complete a size-up of the entire area for obstacles that effect their planned path. This can only be done if the driver slows down so they

can view the area before pulling past to position for backing. Even when spotters are deployed there are times when the driver should dismount to see the area themselves before backing. Spotters do not absolve the driver of responsibility for avoiding a collision.

- Be predictable – The spotter(s) must know where the driver is going to properly assist. Drivers must communicate their planned path before the spotter(s) dismounts the apparatus. If confusion develops the apparatus must stop and a conversation needs to occur.
- Give audible notice – Most apparatus is equipped with a backup alarm of some type. When shifting the vehicle into reverse pause before backing to allow the alarm to engage and provide some warning to pedestrians around the vehicle. Recognize that high levels of ambient noise around the vehicle, such as an active fire scene, may disguise or overwhelm the sound of the backup alarm. Personnel can also become desensitized to the audible warning, so never assume the alarm is heard.
- Use a spotter – The first spotter should normally position at the driver side rear about 10 to 20 feet behind the tailboard. Additional spotters can be helpful in complex situations and should be positioned to watch the passenger side corners to supplement the primary spotter. Spotters need to allow themselves some space cushion to the apparatus and the ability to escape should the vehicle unexpectedly continue backing toward them. The driver and the spotter must make acknowledged eye contact. If the spotter disappears from sight, the driver must stop immediately or risk running over their co-worker. *IF* a spotter is unavailable, conduct a walk around the vehicle before backing.
- Drivers must remove their headset and roll down their window prior to backing – The sense of sound is needed to augment the visual information being gathered in the mirrors. Many collisions have occurred despite the presence of a spotter because the driver momentarily looked away from the spotter and failed to hear the spotter yelling to stop.
- Understand hand and audible signals – Ensure that the driver and spotter have the same understanding of what the signals mean. If confusion occurs the driver needs to stop and establish more clear communications. Spotters need to give clear guidance. The best spotter is often someone who is themselves an apparatus operator.
- Use mirrors – Drivers need to be well versed at using the mirrors. Hanging out the window or physically turning their body around in an attempt to see to the rear are not acceptable practices and should only be done in odd circumstances. Just like while driving forward, the driver needs to scan all mirrors and avoid fixating on just the driver side mirror.
- Beware of the front corners of the vehicle – When backing the front end of the vehicle can swing into blindspots and strike fixed objects that are not visible to the spotter. Landscaping rocks, low retaining walls, fire hydrants, and

protective bollards are all examples of objects than be out of view of the driver when backing. These types of obstacles need to be identified on the approach assessment.

- Maintain speed control – Backing should be done at an extremely slow speed. It is reckless and unnecessary to back vehicles more quickly than a spotter can casually walk.

Parking – Emergency vehicles are parked under a wide variety of conditions and time constraints. Nearly every emergency response will require the driver to decisively park the apparatus in a spot that is selected in a matter of seconds to best support operations. It requires skill and experience to do it fast and without mishap. Where experience is lacking, it must be replaced with a slower pace. New drivers need to learn to slow down upon approach to the scene. Some factors to take into account when positioning an emergency vehicle are as follows:

- Identify existing hazards on the scene and potential hazards as the incident escalates. Recognize overhead wires may fall, flammable liquids flow downhill, and flammable vapors may accumulate in low areas. Traffic is ALWAYS a hazard on every incident scene.
- Know policies that address positioning on the specific incident types, i.e. trench rescues, gas leaks, hazardous materials releases.
- Consider the location of your vehicle's exhaust outlet when responding to outdoor emergencies, such as vehicle crashes or medical emergencies. Avoid positioning your exhaust where it blows into the work area.
- Most emergency vehicles are not designed for off-road use. Before "beaching" an apparatus the driver needs to consider the terrain, the apparatus, the weather, and the legitimate incident needs.
- When operating an ambulance or arriving on a scene later in the incident sometimes it is best to park with consideration to future positioning or departure of the vehicle. There are times when it is important to not commit too deeply into a scene and limit positioning options. Listening to scene reports, knowing arrival order, and seeking guidance from the incident commander are all sources of information regarding positioning.

URBAN DRIVING SKILLS

Even in normal, non-emergency conditions, operating an emergency vehicle in urban areas requires a high degree of skill. Older communities with narrow streets to commercial areas with streets lined with midrise buildings to newer town center mixed use developments all share common hazards for fire apparatus. Bethesda, Rockville, Takoma Park, Silver Spring, the Kentlands, and numerous other areas of Montgomery County pose unique challenges for apparatus operators. Land values and a constantly increasing population

inevitably lead to densely populated areas throughout the County as a transition from rural to urban occurs.

Emergency vehicles are typically larger and heavier than the traffic around them. Even command or staff “buggies” are loaded down with equipment not normally found in a typical passenger vehicle. Urban areas naturally develop limited sight distances and limited space cushions created by gridlocked traffic, narrow travel lanes, raised medians, street parking, and very short setbacks on buildings. These factors are further complicated by pedestrians, alleys, parking lots, landscaping trees, and crosswalks.

Speeds in excess of a posted limit are rarely justified. Excess speed should only be used if the road conditions permit it. Reasonable speed is one of the few factors under the direct control of the emergency vehicle operator that allows more time to react and more opportunity to control the vehicle if an evasive action is required.

Recognize that urban environments diminish the effectiveness of warning lights and sirens. An expected reaction to an approaching emergency vehicle is to pull to the side and slow down or stop. In an urban environment other traffic may not have any space to do this or may choose to do undesirable things. Some of the possibilities are: stopping in the middle of a lane, trying to race ahead of the responding vehicle, or beat the emergency vehicle through an intersection. In extreme cases, aggressive drivers may intentionally interfere with an emergency vehicle they perceive to be delaying their travel.

In other cases motorists may not react at all and just keep traveling. Modern vehicles have a great deal of sound deadening or insulation to increase occupant comfort. The volume of the radio or other entertainment systems, air conditioner noise, phone conversations, and/or poor driving habits of the driver can all be factors leading to a failure to yield to an emergency vehicle.

Emergency vehicle drivers must avoid the temptation to become aggressive when they encounter vehicles failing to yield. Overly aggressive or emotional reactions to civilian motorists will eventually lead to a collision. While seeming counterintuitive, backing off the siren, maintaining following distance, and giving the other driver a chance to think and react is often the best way to handle confused or oblivious motorists. Beware of startling an unsuspecting motorist. They could respond by slamming on their brakes or causing a collision with other vehicles. Vary the siren pitch and duration; use headlights, horn, siren, or spot light to get their attention. Be patient and keep signaling. Be very cautious about passing until you are sure the other driver sees you. If you attempt to pass an unaware driver there is a risk they'll identify you just as you are beside them and panic at a moment where you have no space cushion to react defensively.

Likewise avoid actions that could cause other drivers to enter intersections against the traffic light or crossing into oncoming traffic. In an effort to yield where medians and curbs leave no room another driver may move forward into cross traffic. Urban environments frequently make the use of opposing lanes a

desirable option. Use of opposing lanes of traffic to pass other vehicles must be done with extreme caution as it multiplies the hazards to the emergency vehicle.

Apparatus drivers should learn the typical traffic patterns for their response area. Traffic blockages are common during the morning and evening commutes. Drivers may need to develop different routes for different times of day or days of the week. Construction zones or special events may further enhance the need to identify alternate routes.

When approaching gridlocked areas, slow down before reaching the blockage. This allow you time to identify the path of least resistance if one exists. Do not plow through the middle of stopped traffic when a right turn lane is wide open. The emergency vehicle driver can communicate their intention to other motorists through early lane positioning. Even where a lane is open as you approach, beware of motorists who panic and switch lanes unexpectedly. This can be especially true of right turn lanes or shoulders. Allow the traffic to make a path and avoid trapping your vehicle in a sea of surrounding traffic. Thinking in football terms – the best running backs sometimes let the play develop in front of them before they pick a path to run. If traffic is unable to move, moderate the use of your siren and/or horn as they may only increase confusion or anxiety. Patience will improve your safety and effectiveness.

NEGOTIATING INTERSECTIONS

Intersections are the most dangerous areas for emergency vehicles. Most people consider an intersection the meeting of two streets, however intersections come in many forms. An intersection is anywhere that other vehicles may cross your path, i.e. parking lot exits, alleys, driveways, trails, or railroad crossings.

There are two types of intersections: an *uncontrolled intersection* is any intersection that does not offer a control device (stop sign, yield sign, traffic signals, or railroad gates) in the direction of travel of the emergency vehicle. A *controlled intersection* is defined as any intersection that has a control device that regulates the flow of traffic, including stop signs and traffic signals.

Every intersection is a danger to the emergency vehicle operator until the cross traffic is confirmed to be controlled or absent. When approaching any intersection, consider the following:

- Scan the entire intersection for possible hazards (including vehicles turning right turn on red, pedestrians, vehicles not yielding). Observe conditions beyond the roadway.
- Slow down and cover the brake pedal with your foot.
- Change the siren cadence not less than 200 feet from the intersection.
- Do not assume warning devices are seen or heard unless the actions of other drivers is confirmed.
- Identify a primary path through the intersection as well as contingency paths if unexpected obstructions are encountered.

- Be prepared to stop. This means adjusting speed and covering the brake until the reaction of other drivers becomes obvious.
- Establish eye contact with other vehicle drivers.
- Utilize crew resource management when available. The officer and other crew members may assist in identifying the status of oncoming traffic, but this does not relieve the driver of the ultimate responsibility for avoiding a collision.
- When crossing intersections with multiple lanes of cross traffic proceed one lane of traffic at a time. Treat each lane of traffic as a separate intersection. Be very cautious of intersecting lanes that are not controlled by stopped traffic. Impatient motorists see the open lanes as an opportunity to race past the other stopped traffic.

Before exposing the apparatus to an intersection, the vehicle operator must make sure there is an adequate gap in traffic and/or traffic is yielding. The vehicle operator should at the very least:

1. look left – this traffic is usually the closest and immediate hazard
2. look right – once the left seems ready, check the next set of approaching lanes
3. look left again – ensure the nearest lanes remain safe to cross
4. look straight across – check that opposite traffic isn't turning in front of you
5. check the mirrors – ensure impatient motorists have not pulled up beside you before making a turn

When making a right turn at an intersection from a stop it takes about six seconds to turn right and accelerate to a speed of 30 mph. This time increases with the size of the vehicle. Do not turn in front of other motorists assuming they see your apparatus. Other drivers must have time to react to your sudden appearance ahead of them.

An observation skill that needs to be developed by emergency vehicle drivers is reading the “body language” of other traffic. Some characteristics that can often be observed that help the emergency vehicle operator anticipate the actions of surrounding traffic are:

- Are the other cars changing speed?
- Does the driver appear to be scanning around them? Are they glancing at their mirrors?
- Are the turn signals or hazard flashers activated to try and signal a yielding action?
- Does the driver appear to be talking on a cell phone; either handheld or hands-free?

- Is the other vehicle showing any signs of yielding or changing their position; sometimes other drivers are simply indecisive?

Emergency vehicle operators can help other drivers by remaining predictable and signaling their intentions. Use all means of signaling – lights, sirens, turn signals, lane position, and eye contact or hand signals. As you approach stopped traffic, try to select your lane in advance and position the apparatus accordingly. Be decisive. Avoid weaving back and forth behind stopped traffic as this only increases the chance a civilian motorist will inadvertently switch lanes in front of your approach. Signal the emergency vehicles intent at least one block in advance of an urban intersection and five seconds in rural areas.

Intersections require drivers to constantly scan the roadway, the median, the shoulders, the cross streets, and the mirrors to identify obstacles. Be constantly aware of other responding apparatus, including police units. As you get closer to the incident scene the more likely you are to meet other units at an intersection. This situation can be especially confusing to motorists as they are now faced with yielding to vehicles from multiple directions. Do not forget to scan for bad road surfaces, bicyclists or pedestrians, animals, and diminished clearances (road signs overhanging the road, parked vehicle mirrors or accessories).

Ultimately, emergency vehicle operators must be prepared to some degree to stop at every intersection they encounter. Controlled intersections with stop or yield signals working against the travel route of the apparatus mandate the ability to stop in a controlled manner, however apparatus drivers must constantly search for conditions that could require yielding the right-of-way to avoid a collision.

TURNING VEHICLES AROUND

Any type of turnabout within open travel lanes exposes the apparatus to a collision. Be extremely cautious about passing through parking lots to turn around as they often have limited space, congested traffic lanes, and lots of pedestrians. Residential driveways can also be problematic as they are rarely constructed to hold the weight of heavy apparatus. Choosing a safe location to turnabout is important; choose an area with good visibility. You should have a clear view of the entire path of travel and all traffic lanes. Avoid hills, curves, and blind intersections where motorists may approach your apparatus with almost no warning.

Operators must become familiar with the turning radius of their apparatus to judge what type of turn around maneuver is appropriate or feasible. The types of turnabouts include the U-turn and the three-point turn.

- The *U-turn* is advantageous as it allows the apparatus to avoid backing. It requires a wide roadway and good visibility. Drivers must also remain aware

of road signs or other unanticipated obstacles that hinder the turn. Beware of civilian vehicles entering blindspots when swinging wide for a U-turn; most drivers are not anticipating your maneuver. Look for other vehicles approaching from the driver side rear before you begin to turn.

- The *three-point turn* should only be used when the road is too narrow for a U-turn and other efficient options are not available. Three-point turns in open travel lanes need to be avoided as they tend to be done in a hurry and often a spotter is either not used or becomes exposed to uncontrolled traffic. Impatient or unaware motorists may strike the apparatus broadside or end up behind the apparatus during backing. The opportunity for a negative outcome is significant.

SAFE FOLLOWING DISTANCES

Emergency vehicles need a space cushion during travel to provide the operator time to react to conditions. A safe following distance allows the apparatus to stop or change lanes in a controlled manner without hitting the vehicle ahead should they stop or slow unexpectedly. Rear-end collisions are almost always avoidable when drivers pay attention and maintain good distances. If the proper distance is observed, left and right lateral evasive and other abrupt anti-collision maneuvering is minimized and unnecessary. Emergency vehicle operators must respect that their apparatus is considerably larger in dimension and weight than passenger vehicles. These differences create much larger forces working acting upon the vehicle and thus larger forces to stop the vehicle. The larger forces translate into longer stopping distances.

Drivers must recognize that a safe following distance accounts for their perception time, reaction time, and braking time/distance. Before any braking can occur, the driver must *perceive* a need to brake. This requires the driver to be alert and scanning ahead. *Reaction time* is the period between recognition of a hazard to the time brake application begins. Average drivers require about $\frac{3}{4}$ second. Air brake systems lengthen reaction time by $\frac{1}{2}$ to 1 second due to lag within the system. The driver's ability to perform under stress and the drivers experience are also factors that influence reaction time. Before the brakes even engage as much as 2 $\frac{1}{2}$ seconds may elapse; which equates to nearly 150 feet of travel distance at 40mph.

Braking distance is the distance traveled from the first braking action until the vehicle comes to a full stop. Braking distance varies nearly infinitely due to the factors involved. Vehicle speed, weight, mechanical condition, and tire condition are all factors. Road surfaces, weather, and the driver are also factors that affect braking distance.

An appropriate following distance will allow enough time to come to a full stop if the vehicle ahead of you comes to a sudden stop. One way to estimate a safe following distance for an emergency vehicle is the "four second rule". The four second rule maintains a separation of at least four seconds between the emergency vehicle and the vehicle ahead up to speeds of 40mph. For each

additional 10mph another 1 second is added to increase the separation. In adverse weather conditions, add another 1 second per 10mph.

The four second rule is simple to apply. When the vehicle traveling ahead passes a fixed object, begin counting the seconds. Stop counting when your vehicle passes that same fixed object. Compare this time to the recommended time established by the four second rule to reasonably approximate your safe following distance.

Policy and rules cannot replace sound judgment by the driver. Time and spacing requirements are effected by too many variables to be addressed by more than guidelines. Traffic density or volume, road surface conditions, hazards, roadway design, and speed limits influence the following and stopping distances. When conditions get bad, add more distance.

PASSING ANOTHER VEHICLE

Emergency vehicles are constantly overtaking other vehicles during a routine and emergency driving. In this section, the term “passing” references situations where the emergency vehicle must change lanes or make another maneuver to go around another vehicle. Some considerations to address before passing include:

- Is it necessary to pass?
- Is there a legitimate need to “get around” the vehicles ahead?
- Will vehicle traffic ahead yield in response to your audible/visual warning devices? Do the other drivers see you?
- Does your vehicle have enough residual power to accelerate effectively beyond a moving vehicle?

Roadway information is critical to successful passing. When gathering information to decide about passing, be certain to include the following in your assessment:

- Road signs: No Passing, Intersection Ahead, Pedestrian Crossing
- Pavement markings: Solid centerline, broken centerline
- Road configurations: hills, curves, intersecting roads, driveways

If “No Passing” is advised, the transportation engineers have identified features that could create an unacceptable level of risk for a collision. Often “no passing” areas are established as the result of prior collision history on that road. Never blindly pass a stopped car or line of cars without knowing why they are stopped. Fire department vehicles are not exempt from stopping for school buses loading or unloading passengers. In any situation avoiding mishaps is optimal. The following are some good tips to avoid mishaps when passing:

- Pass assertively. Do not hesitate as conditions change rapidly.
- Stay in the passing lane the shortest time possible.
- Constantly scan the roadway for unmarked, intersecting roadways.

- Mentally note the location of each vehicle you pass so you can identify in the mirror when you've cleared the final vehicle. Visualize their location in relation to the side of the apparatus.
- In non-emergency situations it is often better to decelerate and merge in behind other vehicles than to attempt to accelerate past.

EXPRESSWAY OPERATIONS

The term expressway includes interstates, freeways, turnpikes, or any other type of limited access multi-lane high speed roadway. Entering and exiting expressways require the operator to make quick and accurate decisions in rapid succession. Expressway traffic is often driving in excess of posted speeds and exposes emergency vehicles to traffic that is much more agile.

Entering and exiting expressways is generally accomplished via ramps with varying lengths of acceleration or deceleration lanes. These ramps can be some of the most difficult areas to navigate in larger vehicles as one group of vehicles is slowing down to exit while another set is accelerating to enter. When entering or exiting the expressway, you must monitor the road ahead while simultaneously checking your mirrors. Key points to remember while merging on an expressway:

- Use your mirrors to keep track of adjacent lanes.
- Always be prepared to stop suddenly.
- Look well in advance of your current position. Note vehicles that are approaching the merge area and identify gaps for your merge.
- Adhere to ramp speed limits. Beware of signage indicating roll-over hazards or sharp curves.

Beware that warning devices may startle other motorists as your apparatus approaches from a ramp. Other vehicles may stop suddenly or change lanes in panic. The curve of a ramp and presence of overpasses or sound walls makes visual and audible warning devices less effective. Expect to merge into the flow of traffic as normal, assess traffic flow, and then decide your best lane or approach. Remain predictable to other drivers and avoid weaving from one lane to another.

DRIVING AT HIGH SPEEDS

Driving at highway speeds or in excess of the posted speed limits presents significant hazards to emergency vehicles. Exceeding a posted speed limit is a privilege granted only during emergency response and should only be done with due regard for the safety of other motorists and the emergency apparatus. In all cases, consider the following:

- Posted speeds are based upon the roadway characteristics in good weather conditions.
- Gain and lose speed in straight lines, not in curves.
- Recognize when stopping distance exceeds sight distance. Sight distance is not under the driver's control, but stopping distance is controlled by speed.

- Driving at higher speeds increases the potential for heavy or excessive braking action that may lead to brake fade.
- Higher speeds result in higher momentum and shifts in the center of gravity for a large vehicle.

A moving vehicle naturally wants to stay in a straight line. As a vehicle enters a turn inertia results in centrifugal force that pushes the vehicle in a straight line rather than turning. This centrifugal force increase exponentially with speed. When the centrifugal force becomes too high, the vehicle will either slide or roll over. For every curve or turn, there is a maximum speed for traveling through the curve safely. The tighter the curve, the higher the potential is for centrifugal force, therefore the slower the vehicle must travel. Roadways are sometimes built with a slight side grade to the inside of the curve that aids in countering the centrifugal forces working against the vehicle. If the road is graded toward the outside of the curve this will work against the vehicle and require even slower speeds. In addition to the grade of the surface, the type and condition of the road surface plays an important role in maintaining sufficient traction in turns.

Due to land availability or restrictions, designers often lay out curves in a decreasing radius pattern. This is a design by which the turns start out with a relatively large radius (curve) that tightens as the vehicle passes through the curve. On decrease radius curves, the maximum entry speed is too fast for the later (tighter) portion of the curve. If the speed is too high for the tighter portion of the curve, physics will cause the vehicle to slide or roll over. Drivers must recognize when a ramp or curve is decreasing in radius.

To better define the safe mechanics of transitioning a curve, the following is a breakdown of a curve and proper techniques to pass through it.

Entry – Brake or decelerate to the proper entry speed *before* entering the curve. Enter the curve as far to the outside as possible. Entering on the outside of the curve effectively increases the radius of the track for the vehicle. The greater the radius, the faster the turn can be safely negotiated. Begin the turn as early as possible.

Transition – If the maximum safe speed to maintain control passing through a curve has been attained, the emergency vehicle operator experiences full control of the vehicle. The maximum “safe” speed is not the maximum “possible” speed that conditions will allow. When approaching maximum possible speeds, it will feel as though the suspension is straining. Do not apply aggressive braking. Allow natural friction of the engine and compression to slow the vehicle down. If you are traveling at near maximum speed in a curve, a relatively small event (e.g. some sand or gravel on the road) can cause complete loss of control. Once in the curve, it is best to coast at speed to maintain maximum traction. Attempting to accelerate while in a turn can result in loss of steering control and traction at the rear wheels.

Exiting – Exiting curves requires the vehicle operator to keep the vehicle's speed steady. Maintain position on the inner surface of the curve. Gently accelerate out of the curve after the apex has been reached and the vehicle is on a straight path.

Stopping at higher speeds requires more stopping distance and is harder on the braking systems. Things to consider when braking at high speeds include:

- Braking creates friction that results in heat.
- Overheating in the brake system reduces braking effectiveness.
- Reduce the stress on brake systems by engaging auxiliary braking systems and downshifting the transmission.
- Drum brakes typically fade more quickly than disc brakes due to differences in heat dissipation capability.

UNUSUAL OR DANGEROUS DRIVING SITUATIONS

Driving In Adverse Conditions

Emergency vehicle operators cannot choose to avoid driving in weather conditions that would normally stop civilian drivers. Adverse conditions can be categorized as follows:

- Traction Implications
- Environmental Hazards
- Vision Implications

Emergency vehicle drivers must adjust their driving techniques for all adverse conditions as well as adjust the auxiliary braking systems that may be on their unit. The driver's primary responsibility is the safety of the passengers and arriving safely at the incident. Slow down and drive at a speed reasonable and appropriate for the conditions. Increase following distances and drive smoothly with any vehicle to avoid sudden and dramatic maneuvering.

Traction Implications – Traction can be adversely affected by a variety of conditions. Any materials or changes in the road surface will alter the friction between the road and the tires.

- Rain – In addition to oil buildup, water forms a layer that builds between the tires and the road surface. As little as 1/16th of water can cause hydroplaning of a vehicle. Standing water may also impact steering, braking, and general vehicle operation.
- Chemicals – Road surfaces may have any number of chemicals, but the most common are oil, grease, and fuel. Chemicals can be particularly problematic early in the onset of wet weather before the rain washes away the residue.

- **Snow and Ice** – Snow, slush, and ice create variable road conditions resulting in reduced traction for vehicle tires. Certain roadway features such as bridges or shady areas may accumulate snow or ice prior to other parts of the travelway.
- **Leaves** – Leaves or other vegetation debris can create slippery conditions when allowed to accumulate on the road surface.

Whenever conditions have caused reduction in traction, the driver must reduce speed: and, steer, accelerate, or brake smoothly and evenly. The required stopping distances multiply depending on the condition of the road surface.

Environmental Hazards – Adverse handling could be caused by natural conditions such as high winds, vegetation, and the contour of the terrain. Road construction and design are examples of manmade conditions.

Vision Implications – Conditions that affect visibility include low-light driving, precipitation, vehicle construction, and the condition of the driver.

- **Low-light Driving** – Low-light conditions create various challenges: hidden hazards; increased difficulty in judging the speed of other vehicles, and distance; limited highway lighting; and glare from roadside lights. Even with these limitations and possibly impaired vision, a few simple rules can help the driver compensate.
 - Dim dash and cab lights at night.
 - Reduce speed.
 - Keep headlights and windshield clean.
 - Recognize the blind spots created by the vehicle characteristics.
 - Look beyond the headlights.
 - Keep eyes moving and scan continuously.
- **Precipitation** – Rain, fog, and snow reduce visibility. In addition, rain and fog increase glare both during the day and at night. During the day when the sun is out, the snow on the ground creates a considerable glare as well. Poor visibility conditions require the operator to:
 1. Drive slowly but keep moving.
 2. Turn headlights (low beams only) and wipers on.
 3. Use four way flashers if traveling 15 mph or more below the posted speed limit.
 4. Watch for cars ahead that are moving very slowly.
 5. Avoid decelerating suddenly.
 6. If you must pull off the road, use four way flashers and warning lights.
 7. Use the defroster or air conditioning to minimize fogging on the inside of the windows.

CONTINGENCY SITUATIONS – CAUSES AND PREVENTION

Contingency situations can arise at any time. A contingency situation is described as a possible future event, condition, or an unforeseen occurrence that may necessitate special measures. When they arise, normal traffic flow may be suddenly interrupted and the safety of all persons in the general area is diminished. Emergency vehicle operators must be familiar with contingency situations that occur most often, and to understand the actions that can be taken to minimize to reduce their impact. Five common contingency situations are:

1. *Vehicle malfunction or component failure* – Thorough pre-trip inspections are the key to reducing roadside emergencies. Inspect the vehicle at the beginning of every shift and note any deficiencies. Correct any deficiencies that are easily fixed in the station.
2. *Change or deterioration in the road* – The key to managing changing road conditions is to expand your look ahead distance to recognize approaching hazards. Remain alert, scan well ahead, and look for clues like construction signs or skid marks on the road. Operators must also remain aware of projects or existing conditions in their response district so they can anticipate poor conditions.
3. *Obstacle in the roadway* – Be prepared for an appearance of obstacles in the road (e.g. pedestrians, other vehicles, animals, etc.). In congested urban areas anticipate hazards appearing from side streets, alleys, parking garage exits, or between parked vehicles. Rural roads present more opportunities for animals or debris to enter the roadway.
4. *Weather change* – The DC Metro area presents widely varying and sometimes unpredictable weather conditions. Cold weather brings ice or snow. Summer storms bring the threat of hydroplaning and debris from high winds.
5. *Driver error, inattention, and inexperience* – Fatigue is a significant factor for drivers operating on shift work. Operators must determine for themselves when they are too tired, too sick, too stressed, or otherwise physically or psychologically unprepared to operate an emergency vehicle.

HANDLING CONTINGENCY SITUATIONS

Emergency vehicle operators must be prepared to encounter unusual situations or conditions. The nature of the vehicles combined with the environment offer endless variables that impact safe operations.

Evasive steering and skidding often occur when avoiding pedestrians, animals, vehicles, or other obstacles. These reactions usually occur because the driver either failed to recognize an impending hazard or the hazard appeared so suddenly that it was unavoidable. A driver in this situation needs to weigh the risk

versus reward of their action. Is it worth risking loss of control of the vehicle to avoid a collision with a small animal?

The vehicle driver must constantly scan ahead and to the sides of their vehicle to identify escape routes in the event that braking is not going to avoid a collision. Beware that the crest of a hill, curves, and intersections limit your ability to identify escape routes and therefore reduce your options.

When braking will not avoid a collision, evasive steering may be employed to avoid or minimize the impact of a collision. Operators need to become accustomed to maintaining their hands at the 9 and 3 o'clock position on the steering wheel. This will allow the largest possible turn without moving the hands. The 10 and 2 o'clock positions are more comfortable, but the 9 and 3 o'clock position allows maximal directional control. Evasive steering occurs in two phases; to avoid a collision, turn the steering wheel sharply in the direction of the escape route and then counter steer as soon as the vehicle is clear of the obstacle. If a collision is unavoidable, choose an object with which to collide. When facing such a choice, the operator must rapidly decide which course and object(s) will result in the least severe collision. Head-on collisions are the most damaging collisions because the entire force of the striking vehicle is applied to the fixed object. A sideswiping or indirect collision allows the energy of the collision to dissipate over a long distance since the vehicle remains in motion. Impact absorbing objects are better to choose than large immobile items that will not "give". Some examples of impact absorbing objects are parked cars, bushes and shrubs, guardrails, and small signs. Examples of nonimpact-absorbing objects include bridge abutments, retaining walls, buildings, large trees, and utility poles.

In addition to evasive steering, there are two other forms of maneuvering to avoid collisions – *emergency braking and evasive acceleration*.

- *Emergency braking* – The goal for emergency braking is to produce the shortest possible stopping distance without locking the wheels or losing control. The threshold braking method for accomplishing this is hard pressure to the brake pedal without locking the wheels. Modulate the pressure on the pedal. Apply steady pressure to the point of locking, and then release pressure slightly to get rolling traction. If the wheels lock, **release the brake pedal**. A vehicle with ABS does not require threshold braking because the computer will not allow the brakes to lock up; a steady pressure should be maintained on the pedal. Remember that a rapid stop could cause a rear-end collision; however, this is more preferable than hitting a pedestrian. Remember the action vs. outcome formula.
- *Evasive acceleration* – Evasive acceleration means a quick burst of speed. It can be used to avoid collision with side approaching or merging vehicles. When a vehicle is approaching from the side or merging, increasing speed can often avoid a side impact collision.

HANDLING SKIDS

While weather or road conditions may increase the possibility of skidding, skids are generally caused by one or a combination of these factors:

- Sudden change of speed or direction
- Change of speed or direction under conditions of poor traction
- Weight shift in the vehicle
- Poor tire condition
- Improper tire inflation
- Failure to identify a hazard through inattention
- Improper application of the brakes

To help regain control no matter what type of skid is occurring, ***STAY OFF THE BRAKE; STAY OFF THE ACCELERATOR; AND COUNTERSTEER!*** Steer in the direction that the vehicle rear end is skidding.

There are two key elements to effective countersteering:

- 1) the steering wheel does not have to be turned violently to correct a skid. This a common “panic” reaction, and further trouble arises because the rear tends to skid back and forth (fishtailing);
- 2) After the initial effort to countersteer, it may be necessary to immediately steer in the other direction to help recover.

Skids can be generalized into four categories:

- **Braking skids** – This skid occurs when sudden, hard brake pressure is applied causing one or more of the vehicles to lock. Regardless of how many wheels lock, some control of the vehicle will be lost. If all wheels lock evenly or if just the front wheels lock, the vehicle will continue in a straight line on its prior trajectory unless influenced by some other force (e.g. a dip in the road). If just the rear wheels lock, the vehicle will tend to spin around and end up facing the opposite direction. If a braking skid occurs:
 - Release the brakes immediately in an attempt to regain traction; this will return the ability to steer and attempt further braking.
 - If braking is still necessary, use less pressure to avoid the wheels locking again.
- **Power skid** – The power skid occurs due to sudden, hard acceleration. Since fire apparatus is typically rear-wheel driven, sudden acceleration can cause the rear wheels to lose traction. The back of the vehicle may skid to one side, trying to overtake the front end. The tendency for the rear end to slide will be greatest if the front wheels are turned. The vehicle may even spin all the way around. If a power skid occurs:
 - Release the accelerator.
 - Steer in the same direction as the rear end is skidding.
 - Counter steer to straighten the vehicle.

- **Cornering Skids** – Cornering skids (also called yaw skids) occur when speed is too great or traction is insufficient to keep the vehicle on the intended track around a curve. While the name “cornering” implies travel through an intersection, these skids can also occur on highway ramps or any area where the roadway changes direction. A vehicle naturally wants to follow a straight line and must be forced to follow the intended path around the curve through traction with the road surface. Much like a braking skid, a cornering skid may involve one or more wheels with the vehicle reacting accordingly. If a cornering skid occurs:
 - Release the accelerator.
 - Avoid the temptation to abruptly apply the brakes as this may further reduce traction; it is best to allow natural forces to slow the vehicle.
 - Light application of the brakes may be necessary, but needs to be done cautiously to avoid full loss of control
 - Countersteer as necessary to regain the desired trajectory.
- **Hydroplane Skids** – Hydroplane skids occur when the tire is moving too fast for the water on the road to escape into the tire tread and permit direct contact between the rubber and the road. A small wedge of water builds up in front of the tire and lifts it off the road surface. The water then effectively forms a barrier between the tire and the road surface. Hydroplaning can occur on minimally wet surfaces at speeds of 25 mph. Vehicle reaction during a hydroplane skid is hard to predict. As in all skids, there are varying degrees of brake and/or steering control. A hydroplane skid may not even be perceived by the driver unless the driver attempts to brake or steer. If a hydroplane skid occurs:
 - Release brake and/or accelerator.
 - Allow the vehicle to slow naturally. The vehicle will drop through the water barrier and regain contact with the road surface.

OTHER VEHICLE EMERGENCIES

There are a number of other emergencies that can occur while in transit. The following are some possible emergencies and ways to control them:

- **Rapid Tire Deflation** – Rapid tire deflation is most hazardous when it occurs on the steering axle. The vehicle can violently pull to the side of the blowout or deflated tire. The vehicle will pull to the side of the deflated tire because the flat tire grips the road with more rubber (and more friction) and acts as a pivot. As soon as deflation is detected, the driver should begin to slow the vehicle gradually while seeking a safe area to stop. Anticipate difficult steering and be prepared to make firm movements with the steering wheel. Avoid aggressive braking as they may further disrupt vehicle control.

- **Brake Failure (non-ABS hydraulic brakes)** – Brake failure in hydraulic brake systems generally results from neglect or deterioration of the system. For systems that are not ABS, pumping the brake pedal rapidly during a failure may build up enough pressure (fluid) in the system to provide minimal braking action. Leave any auxiliary braking systems engaged and down shift to allow the transmission to slow the vehicle. As a last resort once the vehicle has slowed, rub the tires against a curb for additional friction. For vehicles equipped with hydraulic service brakes, but an air parking brake another last resort is to apply the parking brake. Beware that applying the parking brake can lock up the wheels abruptly and cause the vehicle to skid.
- **Brake Failure (ABS hydraulic brakes)** – Anti-lock braking systems (ABS) have similar characteristics to non-ABS except they are controlled by a computer system. In the event of a computer failure in the ABS, they are designed to simply behave like a conventional braking system and will continue to stop the vehicle. If a mechanical failure occurs in an ABS equipped vehicle apply steady firm pressure to the brake pedal. Pumping the brakes on an ABS equipped vehicle may actually lengthen stopping distance. Leave any auxiliary braking systems engaged and down shift to allow the transmission to slow the vehicle. As a last resort once the vehicle has slowed, rub the tires against a curb for additional friction. For vehicles equipped with hydraulic service brakes, but an air parking brake another last resort is to apply the parking brake. Beware that applying the parking brake can lock up the wheels abruptly and cause the vehicle to skid.
- **Brake Failure (Air brakes)** – Failure of air brake systems can be the result of loss of air, contamination in the air system, or overheating of components. A catastrophic loss of air will result in the spring (parking) brake applying abruptly and potentially locking up the rear wheels. A partial system failure is more common and causes poor brake performance. Contamination of the air system may result in decreased performance of parts of the system if air lines become clogged or air capacity is reduced. Overheating of the brake pads or shoes occurs when the system is stressed by repeated heavy braking, such as an emergency response through traffic or in long downhill runs. Overheated brakes have a unique odor that most heavy apparatus operators recognize. Overheating results in brake “fade” and the vehicle will not slow down as efficiently because the friction applied by the pads or shoes is reduced. In severe cases braking ability is essentially lost and the pads or shoes can be permanently damaged. If an air brake system is experiencing a failure, use similar approaches as for an ABS equipped hydraulic brake vehicle. Do not pump air brake systems; this will only reduce the air supply. Leave any auxiliary braking systems engaged and down shift to allow the transmission to slow the vehicle. As a last resort once the vehicle has slowed, rub the tires against a curb for additional friction.

- **Transmission Malfunctions** – Complete transmission failures are rare unless the driver shifts between reverse and forward gears without allowing the vehicle to stop first. Most electronic transmissions have built-in features to prevent such damage. Vehicle operators need to recognize and address early indications of trouble in the transmission (e.g. slipping, thrusting etc.).
- **Steering Malfunctions / Failures** – The most common failure in a steering system involves the hydraulic power steering assist. A power steering failure occurs when the engine stalls, fluid in the system is low, or when the belt that drives the system flips or brakes. In a power steering failure the mechanical steering remains functional, however turning the steering wheel will require considerably more effort. Sudden mechanical failure of steering system components seldom occurs when proper pre-trip checks are conducted. If a failure occurs in the steering, slow the vehicle and stop as quickly and smoothly as possible.
- **Accelerator Sticks** - If the accelerator sticks, the driver should attempt to release the pedal by tapping on it with their foot. The next move is to pull the pedal up with their foot. Do not attempt to reach down and pull the pedal as this is likely to result in loss of control of the steering. If the pedal cannot be reset, shift the transmission to neutral and slow the vehicle to a stop. Avoid shutting the motor down until the vehicle is stopped as braking and steering will be more difficult.
- **Wheels off the Road** – Numerous roadways within the County do not have curb and gutter, therefore the pavement transitions to a soft shoulder of gravel or dirt. The shoulder may be immediately adjacent to the white line or the pavement may extend to offer a hard shoulder beyond the white line. Roadways with no hard shoulder pose a significant hazard to large vehicles. Many roll-over crashes involving fire apparatus are the result of over-correction after a set of wheels has dropped off the paved portion of the road and onto a soft shoulder. When the wheels have left the road, the vehicle will tend to pull toward the shoulder. The driver must hold the steering wheel firmly and avoid the temptation to countersteer in panic. The driver should release the accelerator and attempt to bring the wheels back onto the pavement through small steering inputs. These inputs would be similar to those used for a gradual lane change. A large steering input could cause the vehicle to lose control and enter a sideways skid.
- **Dashboard Warnings** – Apparatus operators must be familiar with the various warning lights and messaging screens associated with vehicle monitoring systems. In general, amber or solidly displayed dashboard warnings are advisory while red or flashing dashboard warnings require immediate action. Consult the manuals for your specific apparatus for detailed instructions. Operators should also know what normal operating ranges apply to the gauges and recognize when a vehicle is displaying abnormal “vital signs”.

PARKING PRECAUTIONS

Position of an emergency vehicle on an emergency incident is crucial. While apparatus is often positioned based upon function and assignment the operator must also consider traffic hazards. Utilize onboard cones and flares to enhance the work zone around the apparatus. Park the apparatus to serve as a barrier between oncoming traffic and dismounted personnel. EMS and smaller units should be protected by heavy apparatus whenever possible. When parking on a shoulder or a curb lane, even slightly angling the apparatus helps to keep the crew from opening their doors into open traffic lanes.

When apparatus is exposed to an open lane of traffic or while on an incident, all warning lights should be illuminated per standard procedures. When a unit is parked during a non-incident situation, drivers must exercise good judgement when selecting a parking spot and attempt to adhere to all applicable traffic laws. Apparatus operators need to avoid blocking travel lanes or reducing sight distances near intersections with their parked unit. Parking lots are typically very difficult for apparatus to navigate. If using parking lots, consider staying on the outer fringes of the traffic area to reduce exposure to confined areas and higher levels of vehicle traffic. Do not park in fire lanes or other areas that expose the apparatus to civilian vehicles backing out of parking spaces.

When positioning apparatus, some additional considerations must be taken into account:

- Reduced sight distances due to terrain, vegetation, buildings, vehicles, road configuration may require additional cones or other apparatus to position ahead of the scene.
- Control all avenues of approach around the apparatus. Recognize where intersections or driveways allow civilian vehicles to approach from multiple directions.
- Beware of blinding oncoming drivers with apparatus headlights or scene lights.
- Use a mix of traffic cones and flares as necessary to keep civilian vehicles out of the scene. Flares help illuminate adjacent cones at night, but also can serve as effective barriers during daylight hours.

Safety Reminder – When operating outside the protective shadow of a blocking unit you greatly increase your risk of being struck by a vehicle. **Never** turn your back on approaching traffic. Always face traffic when setting up and removing traffic control devices.



Driver Tips For Fire And Emergency Vehicles.

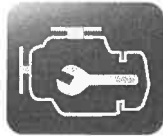
For EPA 2013 Cummins On-Highway Heavy-Duty
And MidRange Engines With Aftertreatment.



This guide covers engine, aftertreatment and emissions-related indicator lamps* found on your vehicle's instrument panel and explains what they mean and the actions drivers need to take when the lamps illuminate. Important information about fuel, oil, Diesel Exhaust Fluid (DEF) and operating tips is also included.

The information in this tips card is specific to Cummins-powered fire and emergency vehicles. If you need information regarding other on-highway applications, please reference Bulletin 4971518.

General Engine Indicator Lamps.



Check Engine Lamp Or Amber Warning Lamp

The Check Engine Lamp (which may also be referred to as the Amber Warning Lamp) illuminates when the engine needs to be serviced at the first available opportunity.

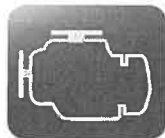


Stop Engine Lamp

The red Stop Engine Lamp indicates, when illuminated, that the vehicle needs to be stopped as soon as it is safe to do so.

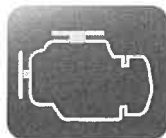
On-Board Diagnostics.

Starting in 2013, all on-highway engines include On-Board Diagnostics as a part of the emissions regulation requirement. On-Board Diagnostics monitors all emissions-related engine systems during operation. If the system detects any emissions-related malfunctions, it will alert the operator to these detected malfunctions through a dash lamp known as the Malfunction Indicator Lamp (MIL).



Malfunction Indicator Lamp (MIL)

The MIL illuminates when the On-Board Diagnostics system detects a malfunction related to the emissions control system. The illuminated MIL indicates that the engine and aftertreatment system should be diagnosed and serviced at your next available opportunity. The MIL can be illuminated along with any of the engine indicator lamps.



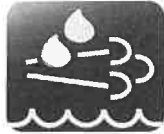
If the MIL is illuminated with the red Stop Engine Lamp, the vehicle should be stopped as soon as it is safe to do so. It should then be taken to an authorized Cummins location for repair.

*Lamps shown are for illustrative purposes only. Be sure to reference your vehicle manufacturer's Owners Manual for specific lamps and details.

Diesel Exhaust Fluid For Selective Catalytic Reduction (SCR) Aftertreatment.

Every vehicle with a U.S. Environmental Protection Agency (EPA) 2010 or newer engine has an on-frame storage tank for Diesel Exhaust Fluid (DEF) and a dash lamp that indicates low DEF levels. Refilling this tank with DEF is critical in order for your vehicle to comply with EPA emissions regulations.

Diesel Exhaust Fluid (DEF) Lamp



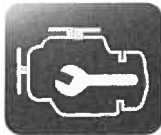
Illuminated

An illuminated DEF Lamp is an indication that the DEF level is low. This can be corrected by refilling the DEF tank with Diesel Exhaust Fluid.



Flashing

A flashing DEF Lamp indicates that the DEF level has fallen below a critical level. This can be corrected by refilling the DEF tank.



Flashing DEF Lamp With Check Engine Lamp/ Amber Warning Lamp

A flashing DEF Lamp combined with an illuminated Check Engine Lamp/Amber Warning Lamp indicates that the DEF level is critically low. This can be corrected by refilling the DEF tank.

Emissions Derate Exemptions.

Cummins EPA 2013 and newer diesel engines for fire and emergency vehicles should not experience any emissions-related vehicle speed or engine torque derates. To determine if there are calibration updates applicable to your engine, contact Cummins Care at 1-800-DIESELS™ (1-800-343-7357) with your Engine Serial Number (ESN). Visit cumminsengines.com/fire-and-emergency for more details and information on engines built prior to 2013.

Diesel Particulate Filter (DPF).

The DPF is an integral component of the aftertreatment system on vehicles equipped with EPA 2007 and newer engines, excluding some EPA 2007 ISM engines. It captures Particulate Matter (PM) in a wall-flow ceramic filter. The exhaust system periodically undergoes regeneration, raising temperatures to oxidize captured PM and clean the system. Lamps alert the driver when a regeneration is needed.



High Exhaust System Temperature (HEST) Lamp

The HEST Lamp illuminates to indicate that high exhaust temperatures may exist due to aftertreatment regeneration. This is normal, and does not signify the need for any kind of vehicle service or engine service. When this lamp is illuminated, ensure that the exhaust pipe outlet is not directed at any combustible surface or material. Reference your Cummins Owners Manual for complete instructions.



Aftertreatment Diesel Particulate Filter (DPF) Lamp

Illuminated

The Aftertreatment DPF Lamp indicates, when illuminated or flashing, that the Aftertreatment DPF requires regeneration. This is accomplished by the following:

1. If the vehicle is equipped with a Regeneration Inhibit Switch, ensure that the switch is not in the Inhibit position.
2. Perform a DPF regeneration by one of the following methods:
 - a. Change to a more challenging duty cycle – such as highway driving – for at least 20 minutes to increase exhaust temperatures.OR
 - b. Perform a parked regeneration.



Flashing

If a regeneration is not performed in a timely manner after the DPF Lamp is illuminated, the DPF Lamp will begin to flash. This indicates a higher level of PM in the DPF.



Flashing With Check Engine Lamp/Amber Warning Lamp

A flashing DPF Lamp combined with an illuminated Check Engine Lamp/ Amber Warning Lamp indicates that the aftertreatment DPF needs regeneration immediately. A parked regeneration is required.



Stop Engine Lamp

If a parked regeneration is not performed, the red Stop Engine Lamp will illuminate. As soon as it is safe to do so, the vehicle should be stopped. It should then be taken to an authorized Cummins location for repair.

Note: Cummins engines calibrated for emergency vehicle use are programmed to not reduce power or speed due to soot load. However, excessive soot load may impact engine performance.

Regeneration Inhibit Switch

The purpose of this switch is to prevent or disable active aftertreatment DPF regeneration. Reference the vehicle Owners Manual for complete operation and use of this switch. Unnecessary or excessive use of the Regeneration Inhibit Switch will result in a loss of fuel economy, or an increased need for parked regeneration.

How To Perform A Parked (Stationary) Regeneration.

If the vehicle has a Manual Regeneration Switch and the DPF Lamp is illuminated or flashing:

- Park vehicle in an appropriate location, set parking brake and place transmission in Park (if provided) or Neutral, and allow up to one hour for the regeneration.
- Set up a safe exhaust area. Confirm that nothing is on or near the exhaust system surfaces.
- Ensure that your fast-idle and power take-off (PTO) switches are off before starting regeneration.
- Push the Manual Regeneration Switch to begin a parked regeneration. Note: Engine speed will increase, and there may be a noticeable change to the sound of the turbocharger during the regeneration process. Once the DPF is regenerated, the engine will automatically return to the normal idle speed.
- Monitor the vehicle and surrounding area during regeneration. If any unsafe condition occurs, shut off the engine immediately. To stop a parked regeneration, depress the brake or throttle pedal.
- Once regeneration is complete, exhaust gas and exhaust surface temperatures will remain elevated for three to five minutes.

Reference your Cummins Owners Manual and vehicle Owners Manual for complete operating instructions.

Fuel, Oil And DEF.

- Use only Ultra-Low Sulfur Diesel (ULSD) fuel.
- CJ-4 (low ash) is the recommended oil.
- Be sure to check the DEF gauge at every refueling. Cummins recommends topping off the DEF tank when refueling. DEF meeting ISO 22241-1 must be used.
- Please read your vehicle manufacturer's Owners Manual to familiarize yourself with the location and capacity of the DEF tank.
- Put only DEF in the DEF tank, which has a blue cap.

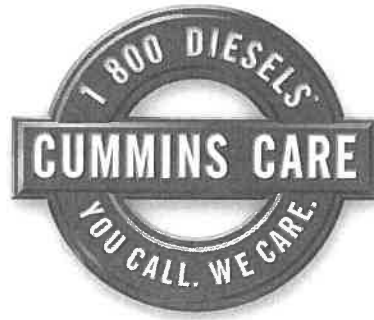


Items Driver Will Notice.

- Under certain conditions (cold or very dry), condensation in the form of water vapor can be seen coming from the vehicle tailpipe. This is normal. It will clear within a few minutes of normal vehicle operation.
- If the engine is left at idle for significant periods of time without reaching the minimum exhaust operating temperatures, the engine will automatically increase the engine idle speed for several minutes to maintain the condition of the particulate filter. This can be interrupted by pressing the service brake.
- After prolonged idle, you may notice momentary white vapor and an odor. This is normal.
- When the High Exhaust System Temperature Lamp is illuminated, you may notice an odor. This is normal. If the odor is excessive and you also notice white vapor, have the exhaust system inspected for leaks.

Cummins Care.

Our authorized service technicians are fully trained to promptly handle any type of service issue. Call Cummins Care at 1-800-DIESELS™ (1-800-343-7357), and representatives will be available to answer product questions and provide assistance during a repair or service event.



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U.S.A.

Phone: 1-800-DIESELS™ (1-800-343-7357)
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INCIDENT OPERATIONS IN OR NEAR VEHICLE TRAVELWAYS

Overview

This document identifies general principles to apply when arriving and working on the scene of incidents on open roadways. It includes parking practices for heavy apparatus and support vehicles that will provide maximum protection and safety for personnel operating in or near moving vehicle traffic. It also identifies several approaches for individual practices to keep firefighters safe while exposed to the hazardous environment created by moving traffic.

It is an objective to position apparatus and other emergency vehicles at incidents on any street, road, highway or expressway in a manner that best protects the incident scene and the work area. Such positioning will afford protection to fire department personnel, law enforcement officers, tow service operators and the motoring public from the hazards of working in or near moving traffic.

Treat vehicular traffic areas with the same caution as any other environment that is immediately dangerous to life and health. At nearly every emergency scene, personnel are exposed to passing motorists of varying driving abilities.

Approaching vehicles may be driven at speeds from a creeping pace to well beyond the posted speed limit. Some of these vehicle operators may be vision impaired, under the influence of alcohol and/or drugs, or have a medical condition that affects their judgment or abilities. In addition, motorists may be completely oblivious to your presence due to distractions caused by cell phone use, loud music, conversation, inclement weather, emotional distress, and terrain or building obstructions. Approaching motorists will often be looking at the scene and not the roadway in front of them.

Nighttime incidents requiring personnel to work in or near moving near traffic are particularly hazardous. Visibility is reduced and driver reaction time to hazards in the roadway is slowed.

TERMINOLOGY

The following terms are commonly used during incident operations, post-incident analysis and training activities related to working in or near moving traffic.

Advance Warning- notification procedures that advise approaching motorists to transition from normal driving status to that required by the temporary emergency traffic control measures ahead of them.

Block- positioning a fire department apparatus on an angle to the lanes of traffic creating a physical barrier between upstream traffic and the work area. Includes 'block to the right' or 'block to the left'.

Buffer Zone- the distance or space between personnel and vehicles in the protected work zone and nearby moving traffic.

Downstream- the direction that traffic is moving as it travels away from the incident scene.

Flagger- a fire department member assigned to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.

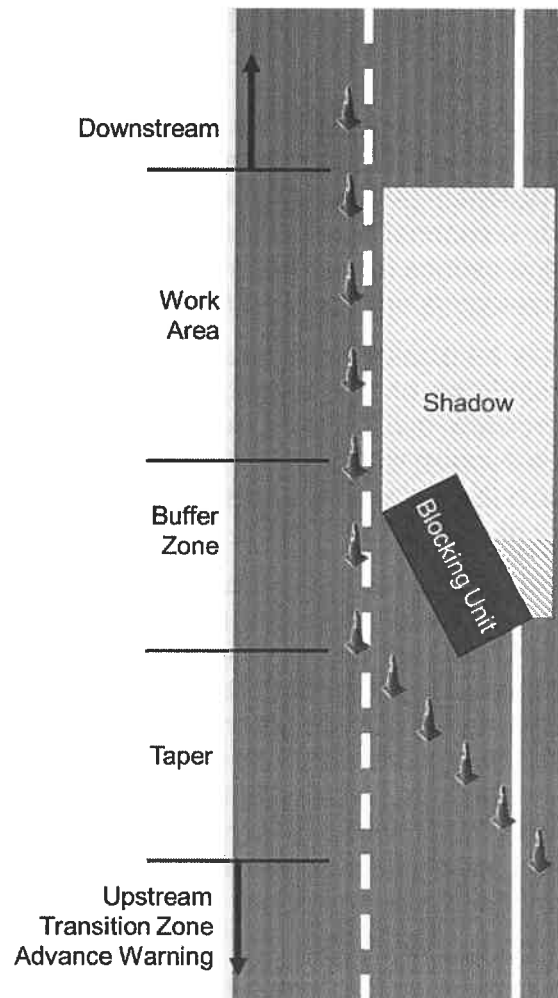
Shadow- the protected work area that is shielded by the block from apparatus and other emergency vehicles.

Taper- the action of merging several lanes of moving traffic into fewer moving lanes.

Temporary Work Zone- the physical area of a roadway within which emergency personnel perform their fire, EMS and rescue tasks at a vehicle-related incident.

Transition Zone- the lanes of a roadway within which approaching motorists change their speed and position to comply with the traffic control measures established at an incident scene.

Upstream- the direction that traffic is traveling from as the vehicles approach the incident scene.



SAFETY BENCHMARKS

All emergency personnel are at great risk of injury or death while operating in or near moving traffic. There are several specific tactical considerations that should be taken to protect all crew members and emergency service personnel at the incident scene including;

1. Never trust approaching traffic.
2. Avoid turning your back to approaching traffic.
3. Establish an initial "block" with the first arriving emergency vehicle or fire apparatus.
4. Follow MCFRS Policy #26-07AM regarding the use of high visibility attire.
5. Be aware that apparatus lights and scene lights may impair the vision of approaching motorists. Use good judgement when setting up portable lighting, be selective about which fixed scene lighting to engage on apparatus, and turn off scene lighting that isn't supporting operations.
6. Use emergency vehicles to initially redirect the flow of moving traffic and set the stage for additional traffic control measures.
7. Establish advance warning and adequate transition area traffic control measures upstream of incident to reduce travel speeds of approaching motorists.
8. Deploy traffic cones to augment apparatus positioning for sustained traffic control and direction. During low-visibility periods, road flares may be intermingled with the cones for increased effectiveness.
9. Designate a fire department member assigned to the "Flagger" function to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.

APPARATUS AND EMERGENCY VEHICLE PRACTICES

In addition to positioning for vehicle function, i.e. deploying hose, ladders, and equipment, apparatus operators must consider the impact of positioning on the work zone established immediately upon arrival at a scene. Listed below are benchmarks for positioning of apparatus and emergency vehicles when operating in or near moving traffic. This information is not limited to high-speed or primary roads, but should be applied when operating on any active vehicular traffic area.

1. Always position first-arriving apparatus to protect the scene, patients, and emergency personnel.
 - a. Initial apparatus placement should create a work area protected from traffic approaching in at least one direction.

- b. Angle apparatus on the roadway with a “block to the left” or a “block to the right” to create a physical barrier between the scene and approaching traffic.
 - c. Allow apparatus placement to be visible to approaching motorists, slow them, and redirect them around the scene. Be especially cautious on curves, on hill crests, and other areas where sight distance may be limited.
 - d. Use fire apparatus to block at least one traffic lane more than that already obstructed by the incident to create a buffer space. Do not block partial lanes – take all of the lane or none of it.
 - e. Whenever possible, position blocking apparatus to eliminate the possibility of a stray vehicle passing through the work zone. Close gaps on the shoulders and take advantage of existing obstacles, such as guardrails, curbs, signs, and vegetation, to harden the edges of the work zone. Anticipate impatient or impaired civilian drivers using the shoulders, leaving the paved surface, or weaving through apparatus.
 - f. Dependent upon the incident type, position apparatus in such a manner to protect the pump or aerial operator position from exposure to approaching traffic. Consider a blocking vehicle to protect aerial apparatus stabilizers that are in close proximity to open lanes of traffic.
- 2. Utilize Class B or A apparatus to create a safe parking area for EMS units and other fire vehicles. Heavy apparatus provides a greater degree of protection against a wider variety of vehicles. Operating personnel, equipment and patients should be kept within the “shadow” created by the blocking apparatus at all times.
 - 3. Blocking apparatus should protect a work zone that includes all operational areas of the incident. This includes any hoselines, damaged vehicles, roadway debris, patient triage and treatment areas, extrication work areas, personnel and tool staging areas, and ambulance loading zones.
 - 4. Ambulances should be positioned within the protected work area with their rear patient loading door area angled away from the nearest lanes of moving traffic. Account for the swing area of the side entry door of the unit as well.
 - 5. Identify staging for unneeded emergency vehicles that is off the roadway or return these units to service whenever possible.
 - 6. At all intersections, or where the incident may be near the middle lane of the roadway, two or more sides of the incident will need to be protected.
 - a. Police vehicles must be strategically positioned to expand the initial safe work zone for traffic approaching from opposing directions. The goal is to effectively block all exposed sides of the work zone. The blocking of the work zone must be prioritized, from the most critical or highest traffic volume flow to the least critical traffic direction.

- b. For Engine or Aerial companies where operators may need to work around the vehicle, block so that the pump or operator panel is “down stream” or within the shadow of the vehicle. If not in structural firefighting gear, vehicle operators need to follow Department policy regarding high visibility attire.
 - c. At intersection incidents, consider additional resources to cover the various approaches to the scene. Provide specific directions to additional units regarding traffic control needs. Use resources efficiently.
7. Traffic cones should be deployed upstream of the blocking apparatus toward approaching traffic to increase the advance warning provided for approaching motorists. Cones identify and suggest the transition and tapering actions that are required of the approaching motorist.
- a. While deploying and retrieving cones from an active roadway personnel should face oncoming traffic. When deploying cones, start at a point farthest from the incident scene and work back to the blocking unit. When retrieving cones, reverse the process. Avoid walking in the open/unprotected lanes of traffic whenever possible.
8. For complex or highway incidents, utilize additional traffic control resources in the form of police assistance and State Highway Administration units.

INCIDENT COMMAND PRACTICES

The **initial-arriving company officer** and/or the **Incident Commander** must assure a protected area for personnel and involved civilians is established and maintained including;

1. Assure that the first-arriving apparatus establishes an initial block to create an initial safe work area.
2. Include traffic control in the ongoing scene size-up and consider the need to retain units on the scene for the sole purpose of traffic management as the incident is mitigated.
3. Assign a parking location for all ambulances as well as later-arriving apparatus.
4. Assure that all ambulances on-scene are placed within the protected work area (shadow) of the larger apparatus.
5. Assure that all patient loading into EMS Units is done from within a protected work zone.
6. Assure all fire and rescue personnel don appropriate protective clothing and/or high visibility attire per MCFRS Policy #26-07AM.
7. The initial company officer and/or Incident Commander is the Safety Officer until this assignment is delegated.
8. Command shall assure that scene lighting and vehicle lighting is not creating a hazard for oncoming motorists.

PERSONNEL PRACTICES

Listed below are safe practices for **individual personnel** when operating in or near moving vehicle traffic.

1. Always maintain an acute awareness of the high risk of working in or near moving traffic.
2. Never assume a passing motorist will do the right thing.
3. Always look before you move!
4. Avoid turning your back to moving traffic.
5. Do not open apparatus doors into open lanes of traffic. Apparatus operators should angle the vehicle to provide a shadow on every incident.
6. If personnel must exit apparatus into active traffic lanes do so methodically and while paying full attention to the oncoming direction of traffic. Engine company personnel initiating a supply line lay are particularly susceptible to tunnel vision while exposed to uncontrolled traffic.
7. High visibility attire must be donned per MCFRS Policy #26-07AM.
8. When working around apparatus, be alert to the proximity of moving traffic.
 - a. Before stepping to the exposed side of the vehicle, stop at the corner of the unit, check for traffic, and then proceed along the unit remaining as close to the emergency vehicle as possible.
 - b. Maintain a reduced profile when moving through any area where a minimum "buffer zone" condition exists and minimize exposure time.

LIMITED ACCESS HIGHWAY OPERATIONS

Limited access highways include Interstate 270, Interstate 495, and the Inter-County Connector. It is important to understand the goal of Maryland State Police and State Highway Administration is to keep the traffic moving on these high-volume thoroughfares. This conflicts at times with the desire of the fire and rescue department to establish safe work zones. A work zone may require shoulder closures, lane closures, a complete shutdown of the travelway, or a combination of each throughout the incident. Complete shutdowns should rarely occur and should be for as short a period of time as practical.

Unique considerations for highway incidents include:

1. First-arriving engine company apparatus shall establish an initial block of the lane(s) occupied by the damaged vehicle plus one additional traffic lane.
2. Additional heavy apparatus should be assigned to the sole function of blocking to layer the protection between responders and passing traffic.
3. Personnel assigned to blocking apparatus should build upon or establish workzone protection as needed, including;

- a. Establish an upstream block occupying a minimum of two lanes plus the paved shoulder of the highway or blockage of three driving lanes of traffic upstream of the initial block provided by the first-due apparatus.
 - b. The position of this apparatus shall take into consideration all factors that limit sight distance of the approaching traffic including ambient lighting conditions, weather-related conditions, road conditions, design curves, bridges, hills and over- or underpasses.
 - c. Traffic cones and/or cones illuminated by flares should be placed upstream of the blocking apparatus by the crew at the direction of the company officer.
 - d. Assign a Flagger person to monitor the response of approaching motorists as they are directed to transition to a slower speed and taper into merged lanes of traffic.
 - e. Notify Command on the incident operating channel of any approaching traffic that is not responding to the speed changes, transition, tapering and merging directions.
4. Police Department vehicles will be used to provide additional blocking of additional traffic lanes as needed, however do not provide the level of blocking protection afforded by heavy apparatus.
 5. EMS Transport Units should always be positioned within the work zone in the shadow of heavy apparatus.
 6. Staging of additional resources off of the highway that are not immediately needed on the scene may be considered. Examples include EMS Transport Units staging at interchanges while awaiting patient triage and treatment completion or Engine Companies staging in anticipation of water supply assignments.
 7. Incident Commanders should establish a liaison with the Police Department as soon as possible to jointly coordinate a safe work zone and to determine how to most efficiently resolve the incident and restore normal traffic flows.
 8. The termination of the incident must be managed with the same aggressiveness as initial actions. Removal of traffic controls needs to be methodical and personnel safety must remain a priority. Crews, apparatus, and equipment should be removed from the highway promptly, to reduce exposure to moving traffic and minimize traffic congestion. The last vehicle to leave the scene should be the blocking apparatus.

Protective Apparatus Parking Factsheet



Traffic Safety Tips

1. Never Trust the Traffic
2. Engage in Proper Protective Parking
3. Wear Reflective Traffic Safety Vests
4. Reduce Motorist Vision Impairment
5. Use Apparatus to Block
6. Supplement Motorist Warning with Cones and Flares
7. Arrive, Block, Work Swiftly, Safely Depart the Scene

Work Zones Elements

Advanced Warning Area – Signs are placed to inform road users of the upcoming incident area.

Transition Area – First area where motorists are redirected from their normal path.

Buffer Space – Space beginning at transition zone to first blocking unit. Motorists should be shuffled into alternative lanes at buffer.

Activity Area – Buffer space and Shadow Space. Area taken for apparatus positioning and work zone.

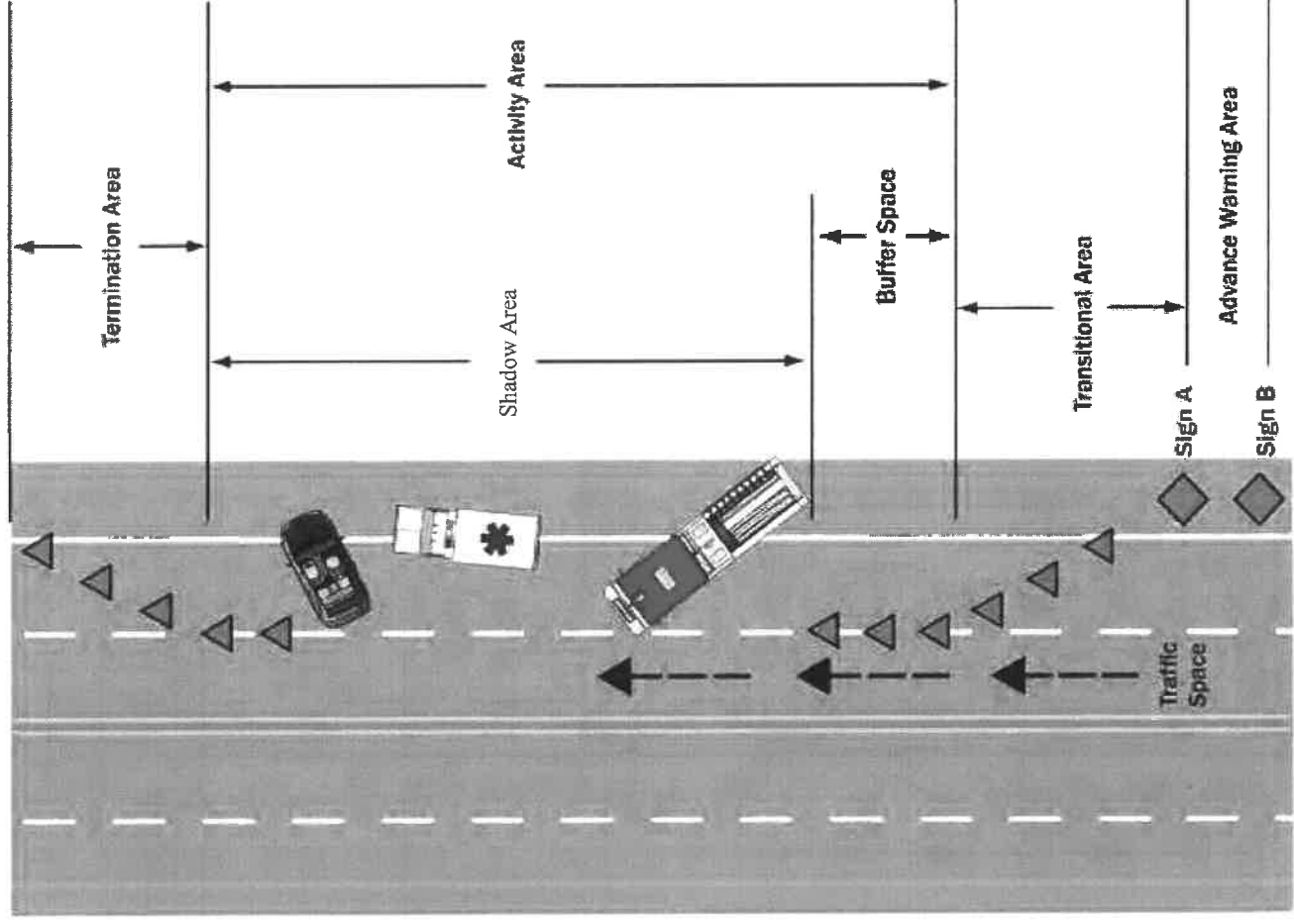
Shadow Area – Protected area created by blocking units. Safer place for responders to work.

Termination Zone – Marks end of work zone. Gracefully transitions motorists back to traditional travel lanes.

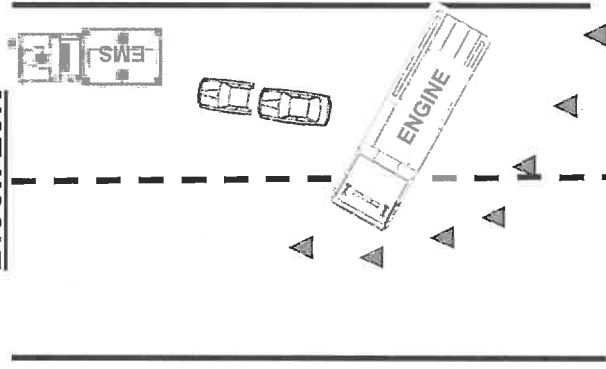
CHART Truck

Coordinated Highway Action Response Team – MDOT truck equipped with road cones and advance warning devices.

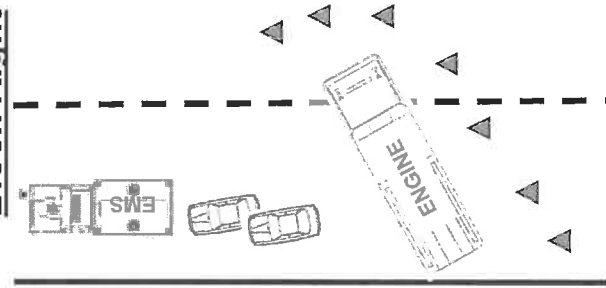
CHART can respond and help to establish the work zone. All work zone elements must be deployed if incident duration exceeds 30 minutes.



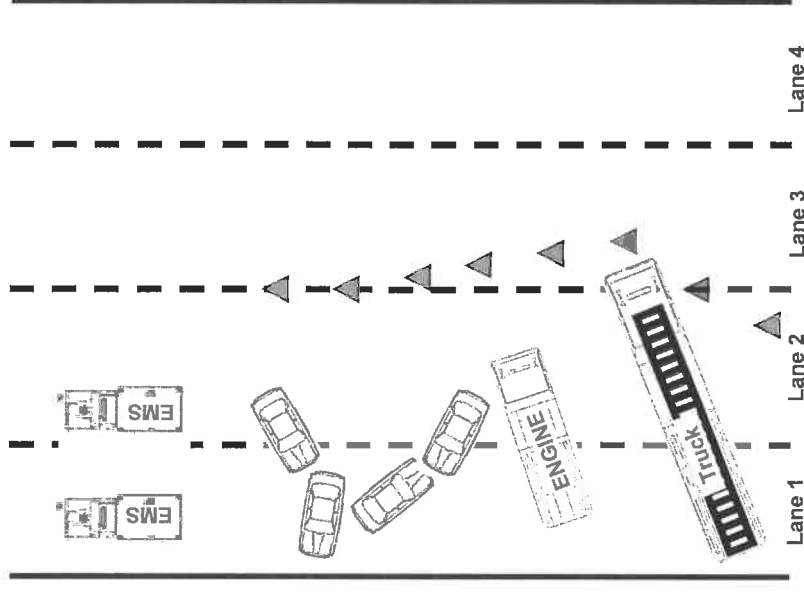
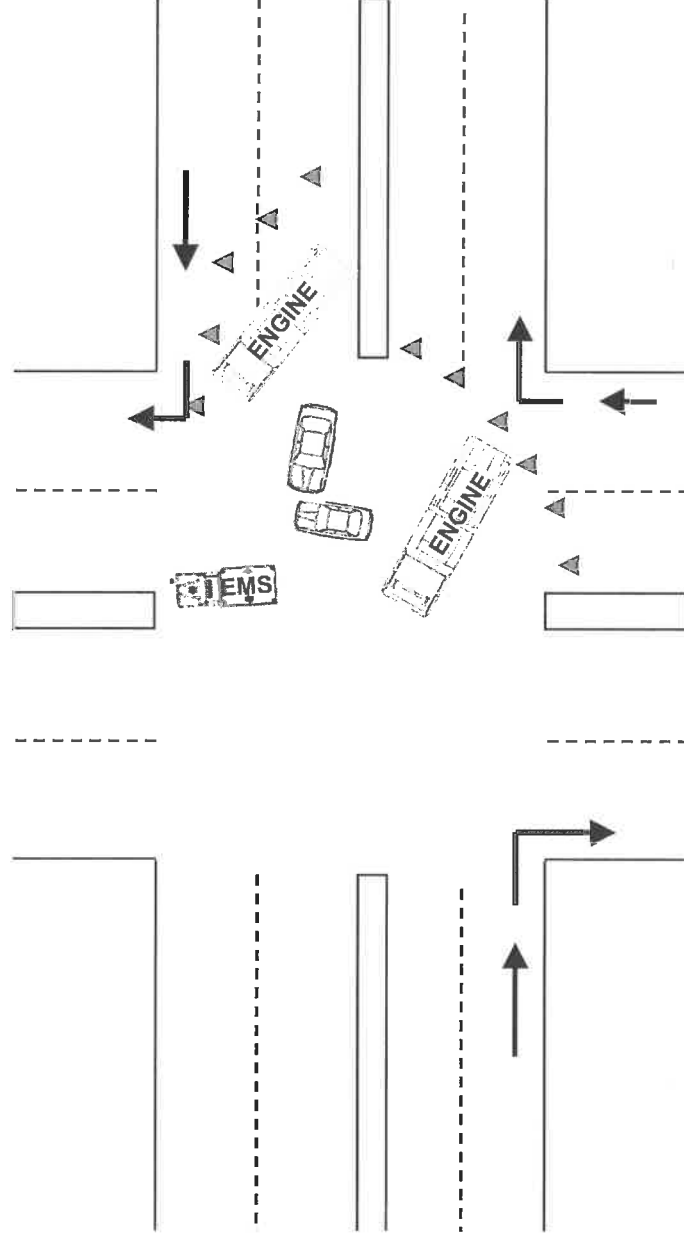
Block Left



Block Right



Where possible, angle the apparatus at a 45 degree angle from the curb.

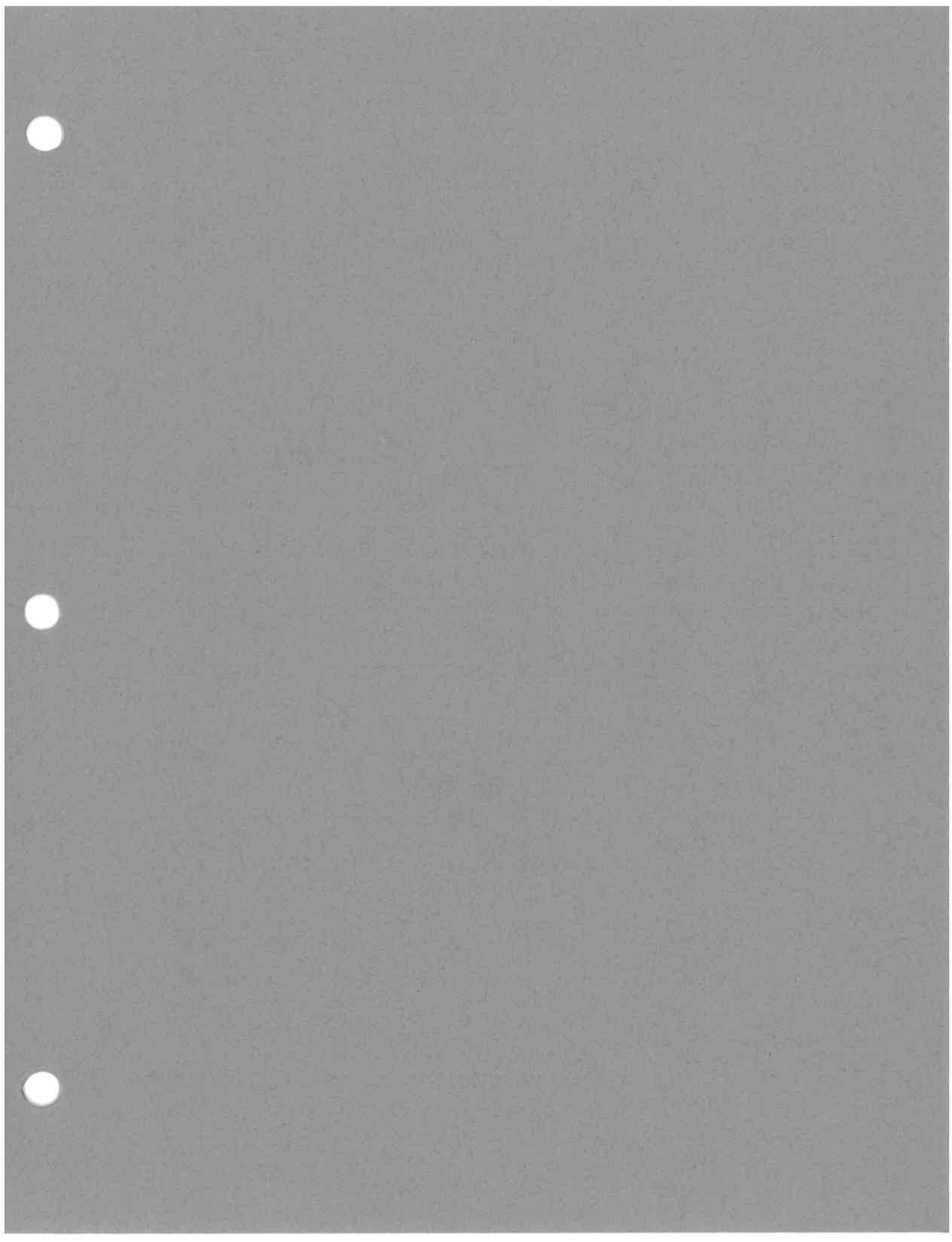


Operations on high speed or multi-lane highways will necessitate additional blocking apparatus.

Often times, two or more sides may need to be protected. Prioritize placement of the apparatus by blocking from the most critical to least critical sides.



For more information, see instructor's guide and videotape.





Use of Snow Chains

The use of tire snow chains and the criteria for when to apply them varies widely throughout the county. Improperly applied snow chains have caused significant damage to the apparatus and delayed the response of units. This memorandum is intended to provide guidance on the use of snow chains during various types of inclement weather.

In general there are two types of chains in use in the county:

1. **Permanently installed “On-Spot” chains.**
2. **Standard removable tire chains.**

Permanently mounted **“On-Spot” chains** or “automatic chains”, consist of short lengths of snow chain attached to a small drive wheel that, when activated, contacts the inside tire of the rear duals. These devices rely on centrifugal force to throw the lengths of chain under the tire. Depending on need, these chains can be raised or lowered from the cab of the apparatus. For best operation these chains **should be engaged while the unit is moving**. These chains work well when the apparatus can maintain slow but steady speeds, such as in shallow snow or on intermittently clear or covered roadways. These chains will not work well in deep snow or when conditions bring the apparatus to a crawl. **DO NOT drive faster than 25 mph when you are using “On-Spot” chains! RAISE the chains anytime that they are not absolutely necessary.** Driving at higher speeds for prolonged periods **will** damage or destroy the “On-Spot” assembly and **will cause tire damage that may lead to failure.**

Removable **standard tire chains**, also known as “drop chains”, are applied manually to the outside tire of the rear duals. They must be applied so that they are well distributed around the tire and fit snugly. A video on proper installation of these chains is available. Standard tire chains offer better performance than “On-Spots” in deep snow, heavily rutted snow, and on ice. This is because they do not rely on centrifugal force to place them under the tire. Standard tire chains can be used at the same time as “On-Spots” because they affect different tires. Using both types at the same time increases the likelihood that a chain will be under the tread at any given time, and therefore increases traction. Unfortunately, standard tire chains can be very damaging if they come loose. Units utilizing standard tire chains should carry lengths of coat hanger wire or mechanic’s wire (available in the shop) to secure broken sections in the event of a failure. **Plastic cable ties will not work.** In some cases, if the broken section cannot be secured, the entire chain may have to be removed before a unit can continue. The video will provide more information about broken chains and chain repair.

The following guidelines should be followed for chain usage:

Less than 6 inches of snow on the ground or predicted: Use the apparatus mounted “On-Spot” chains. Be sure to raise the chains on cleared pavement or when they are not needed for traction. Monitor the weather for changes that might produce

more than 6 inches of snow and be ready to apply standard tire chains if conditions worsen.

6 inches of snow on the ground with more falling or forecasted: Apply the standard tire chains, and **RAISE** the “On-Spots”. **DO NOT drive faster than 25 mph on clear pavement for any reason.** If a chain breaks, then **STOP** the unit as quickly as possible in a **SAFE** place. Notify ECC that you are out of service until you can repair or drop the chain. Carry a snow shovel to aid in clearing snow from under the unit if a repair is necessary and to clear walkways if needed at the scene of an incident.

Blizzard Conditions: Apply and use the standard tire chains. **Do not use the “On-Spot” chains unless you are stuck and have a tire that is spinning.** Raise the “On-Spots” as soon as you regain traction. Observe the rules stated above concerning speed and chain breakage. Carry scoop and spoon shovels on the unit if possible. These shovels will allow for quicker digging through plow banks and packed drifts that would bend or break normal snow shovels.

Ice: Apply the standard tire chains and **use them in conjunction with the “On-Spots”.** Recognize that ice is by far the most dangerous road surface we have to deal with. Allow several times your normal stopping distance and reduce speeds dramatically prior to entering turns. Carry sand, absorbent, or ice melt to improve traction in small work areas and to aid you if you get stuck. **Pay close attention to other vehicles moving in your proximity.**

All personnel must monitor the condition of the roadways in their response area for changes throughout their shift, and report these changes to the on-duty station officer. This monitoring must include getting up periodically at night. All personnel should realize that changes in road conditions may force them to apply and remove chains more than once in their shift. **Authority for applying chains will rest with the on-duty station officer** unless orders are received from a higher authority. When the station officer makes the determination that chains are needed he or she will notify the on-duty Battalion Chief and the LFRD representative. Personnel driving the apparatus should remember that vehicle speed can be determined with AVR technology.

As a general rule **units running with standard tire chains should not be on the Interstate Highways** because they cannot exceed 25 mph. Driving at 25 mph on the Interstates produces one hazard, while driving at higher speeds with the chains on produces another. This rule will impact the patient transport practices of the north county stations. For this reason, the on-duty station officers and battalion chiefs should consider using one type of chained vehicle to access patients and remove them to cleared roads where they can be transferred to an unchained unit for transport. Notify ECC of your intended strategy.

ONSPOT

DESCRIPTION OF OPERATION

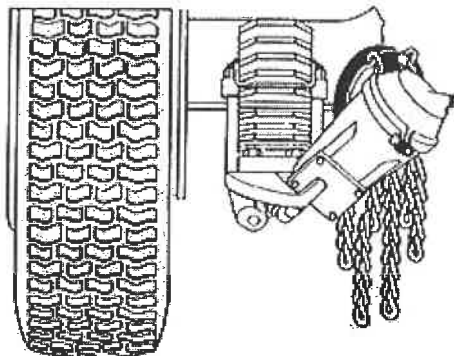
The Onspot Automatic Tire chain offers the traction of a single set of conventional snow chains at the flip of a switch, without having to stop the vehicle.

An electric switch mounted in the cab provides 12 volts to an air solenoid mounted on the vehicle's frame rail. Compressed air to the solenoid is supplied from either the vehicle's onboard air system or a 12-volt compressed air kit.

When the dashboard switch is activated, the solenoid opens allowing compressed air to enter the air chamber and lower the chainwheel so it contacts the inside of the tire. The friction between the tire and the rubber-covered chainwheel causes the chainwheel to rotate, creating enough centrifugal force to flail the chains out in front of the tire. (The principle of the system is similar to a small generator driven by a bicycle tire to operate a headlight.)

Six lengths of chain spaced at 60-degree intervals on the chainwheel ensure that there are always two (2) chains between the tire and road surface whether you are accelerating, braking or are in a wheel lockup condition. The traction from the chainwheel is obtained in forward OR reverse.

When the dashboard switch is turned off, the solenoid exhausts the air provided to the chain units and return springs in the air chambers bring the chainwheels back to their resting position.

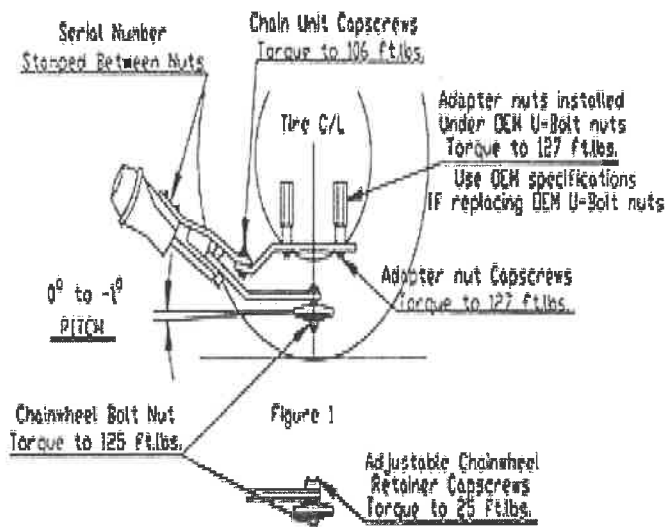




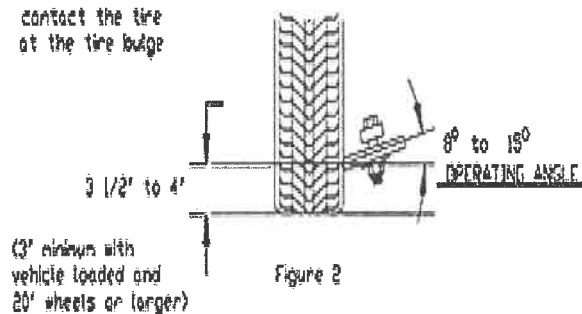
Keep your Onspots in tune

General Guidelines

Bulletin # 3130027



Chainwheel should contact the tire at the tire bulge



2 3/4' contact on loaded vehicle with 16' wheels and 170mm chainwheel

Red Chainwheel Driver Side
Blue Chainwheel Passenger Side

Grease Arm Bearings

Check Play In:
Ball Joint
Chainwheel Bearings
Arm Bearings

Check Tire Sidewall Pressure
(minimum 20 Lbs)

Check Chainwheel Contact
Operating Angle
Pitch
Contact Height

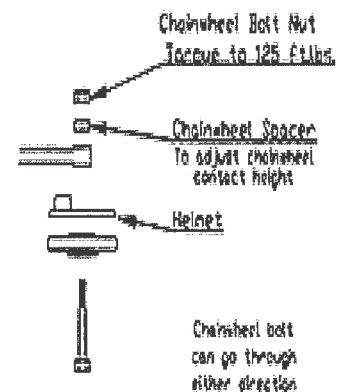


Figure 4

1-800-224-2467

Montgomery County Fire and Rescue Service

FIRE CHIEF'S GENERAL ORDER

NUMBER: 12-01

February 21, 2012

TO: All MCFRS Personnel

FROM: Fire Chief Richard R. Bowers



SUBJECT: Winter Driving and the Use of Vehicle Snow Chains

This General Order provides guidance on winter driving and the use of snow chains during various types of inclement weather. The use of snow chains and the criteria for when to apply snow chains will vary throughout the County because of disparate local weather conditions at any given time. Improperly applied snow chains have caused significant damage to apparatus and can delay unit response. Risks to personnel and the apparatus should be calculated before attempting to access areas that have not been cleared of snow.

All personnel must monitor the condition of the roadways in their response area for changes throughout their shift, and report these changes to the on-duty station officer. Station officers must ensure this monitoring occurs periodically throughout the night. Methods of monitoring include traffic cameras, local television, visual checks of the station's parking lot and roads immediately surrounding the station, as well as responding to and returning from incidents. This is not to imply that units should leave the station to check the roads. All personnel must remember that changes in road conditions may require the application and removal of chains more than once during a shift. The on-duty station officer has the authority to order the application of snow chains. When the station officer determines that chains are needed, he or she will immediately notify the on-duty Battalion Chief and the LFRD Duty Officer. Battalion-wide or County-wide snow chain use will be ordered by the Duty Operations Chief and communicated through the on-duty Battalion Chiefs.

MCFRS apparatus uses two types of chains: **permanently mounted or "automatic" chains**, and **removable crosslink chains**.

Automatic Chains

Automatic chains are short lengths of snow chain attached to a small drive wheel, that when activated, contact the inside tire of the rear duals. Centrifugal force throws the lengths of chain under the tire. When they are needed, the chains are controlled, i.e., raised or lowered, by the driver. For effective operation, these chains should be engaged while the unit is moving 3-25 MPH. These chains work best when the apparatus can maintain slow but steady speeds, such as in shallow snow, or on intermittently clear/covered roadways.

Automatic chains *do not* work well in accumulations over six inches of snow or when driving conditions do not permit apparatus speed to exceed approximately 5 MPH.

Original equipment manufacturer guidelines must be followed for specific types of automatic chains specifically related to driving speeds. Drivers **must raise** these chains whenever their use is not absolutely necessary, because driving at higher speeds for prolonged periods will destroy the drive wheel assembly first, and will then cause damage that may lead to catastrophic tire failure.

Station commanders must ensure that automatic chains for units assigned to their station and so equipped, are operational.

Removable Crosslink Chains

Removable crosslink chains are applied manually to the outside tire of the rear duals. The chains must be well distributed around the tire and fit snugly, using bungee-style tensioners. These chains perform better than automatic chains in deep or heavily rutted snow and ice because they do not rely on centrifugal force to place them under the tire. Removable crosslink chains can be used at the same time as automatic chains because they affect different tires. Using both types at the same time increases the likelihood that a chain will be under the tread at any given time, and, therefore, increases traction. Removable crosslink chains can cause severe damage if they work loose or break. **Units using these chains should secure all fold-over locking latches with sixteen (16) gauge mechanic's wire and carry this item on the vehicle to secure broken sections if a failure occurs.** If the broken section can not be secured, the entire chain may have to be removed before a unit can continue its response.

Station commanders must ensure that removable crosslink chains are available in the station for the winter season, including:

- 1. Correct quantities and sizes for all apparatus, including a set of chains per axle for all tandem axle vehicles.**
- 2. Chains and links in proper working order.**
- 3. Repair materials available for the application and repair of snow chains.**
- 4. Tools readily available for the application and repair of snow chains.**

Automatic Traction Control (ATC) and Differential Locks

Some apparatus is equipped with ATC and/or a differential lock.

All drivers should be aware of guidelines concerning the function and use of automatic traction control and differential locks for apparatus for which they are responsible. These guidelines may be found in the vehicle's driver/operator manuals.

Note that newer apparatus is equipped with the ability to manually activate ATC.

Tandem Axle Vehicles

Tandem axle vehicles are not equipped with automatic chains. The combination of weight, ATC, differential locks, and inter-axle locks should allow these vehicles to handle the majority of snow events without removable crosslink chains.

All drivers should be aware of the guidelines concerning the function and use of driver

controlled differential locks and inter-axle locks for tandem axle vehicles. These guidelines may be found in the vehicle's driver/operator manuals.

All-Wheel Steer (AWS) aerials are not equipped with automatic chains and Pierce Manufacturing, Inc. prohibits the use of removable crosslink chains.

Guidelines for Using Snow Chains

1. **When using ANY type of snow chain, frequently reassess the need for their use and inspect the chains after returning to the station. Tighten, repair, and/or replace as required.**
2. Do not exceed 25 MPH using **ANY** type of snow chain or when the inter-axle lock is engaged.
3. **Less than 6 inches of snow on the ground, or predicted.** Use automatic chains. ***Raise the chains on cleared pavement*** or when they are not needed for traction. Monitor weather forecast for changes that might produce more than six inches of snow and be ready to apply removable crosslink chains if conditions worsen.
4. **Six inches of snow on the ground with expected continued accumulation.** Apply and use removable crosslink chains and ***raise*** the automatic chains. Use permanently mounted or automatic chains only as needed, and raise them as soon as you regain traction. **AWS functions should be disabled under these conditions.**
5. **Blizzard Conditions.** The Operations Division will coordinate with the Fleet Section to call back Fleet Section personnel and provide additional resources or amended response plans. Apply and use removable crosslink chains. ***Do not use the automatic chains unless you are stuck and have a tire that is spinning.*** Raise the automatic chains as soon as you regain traction. **AWS functions should be disabled under these conditions.**
6. **Ice.** Apply and use removable crosslink chains. ***Do not use the automatic chains unless you are stuck and have a tire that is spinning.*** AWS functions should be disabled under these conditions.
7. **Other guidelines when using snow chains.**
 - a. Allow several times your normal stopping distance, and reduce speeds dramatically before entering turns.
 - b. Carry sand, absorbent, or ice melt to improve traction in small work areas, and to help if you get stuck.
 - c. Pay close attention to other vehicles moving near you.
 - d. The front axle is usually lighter per square inch of tire surface, and will be the first to lose traction on ice.
 - e. ***In ALL situations, if a removable crosslink chain breaks, STOP the unit as quickly as possible in a SAFE place.*** Notify ECC that you are out of service until you can repair or drop the chain.
 - f. All units should carry a snow, scoop, or spoon shovel to clear snow

from under the unit if a repair is necessary.

- g. Occasionally, parking apparatus farther from an incident and proceeding to the scene on foot should be considered. Remember that snow banks may contain ice and debris and often disguise obstructions, e.g. rocks, hydrants, posts, etc.
- h. If directed by the Operations Division to chain tandem axle vehicles, both rear axles will be chained with removable crosslink chains.
- i. Remember with tandem axle vehicles, that automatic traction control should only be used if you are stuck. Otherwise it should be turned off during snow conditions. Also, remember to use your inter-axle and differential locks when you are stuck.

8. ***As a general rule, units running with removable crosslink chains should not drive on the Interstate Highways because of their speed restriction.***

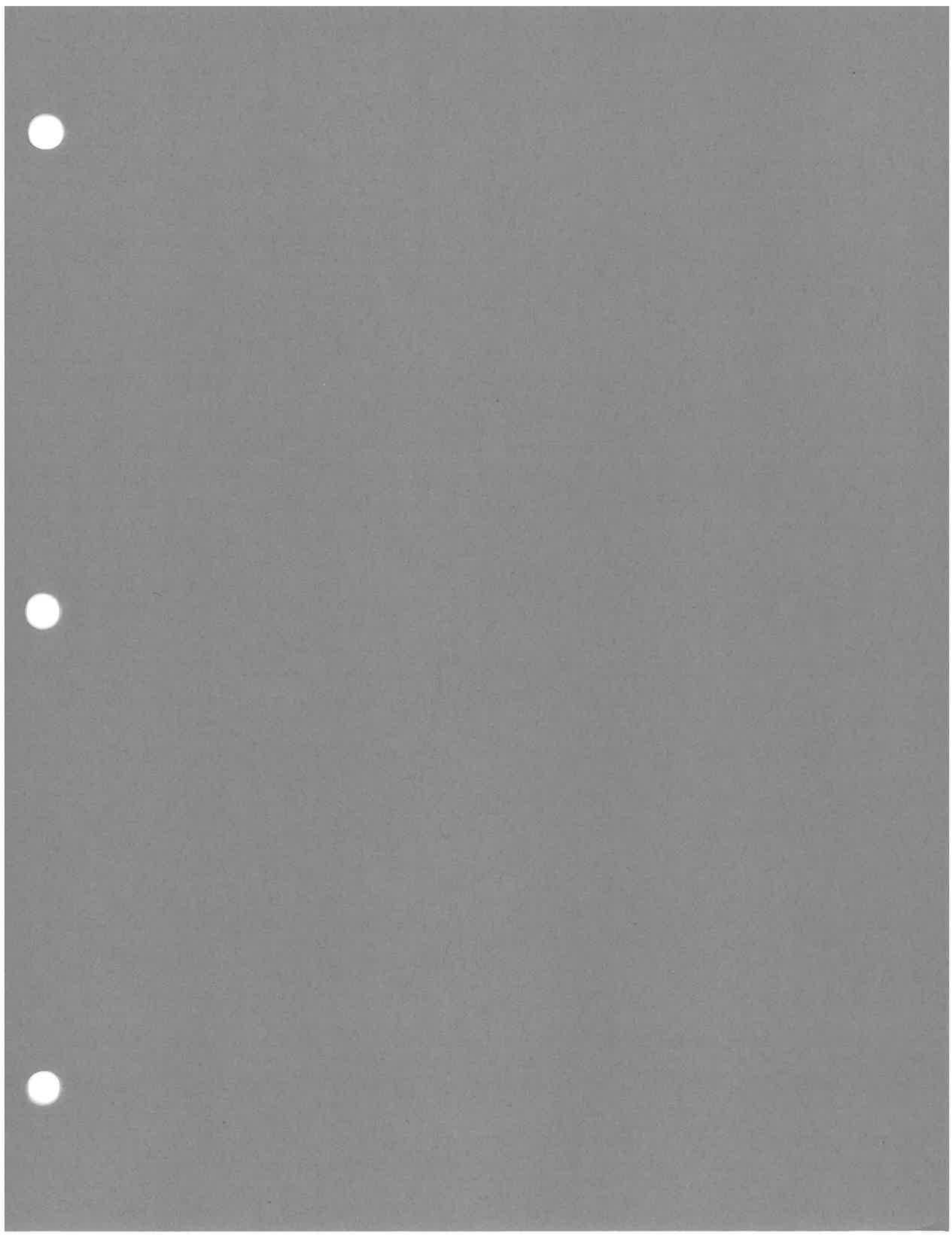
Significantly reduced speed on the Interstate Highway will cause one hazard, while driving at higher speeds with the chains applied may cause another. This will impact the patient transport practices of EMS units serving the northern County stations. *Station officers, LFRD Chiefs, and Battalion Chiefs should consider using one type of chained vehicle to access patients and remove them to cleared roads where they can be transferred to an unchained unit for transport. Remember to notify ECC of your intended strategy.*

9. Use this weblink as a reference to snow operations in Montgomery County, Maryland:

<http://www.montgomerycountymd.gov/hwytpl.asp?url=/content/dot/highway/snowplow.asp>

Please address any questions to Asst. Chief Richard Holzman, 240-777-2485.

- Supersedes Fire Chief's General Order #08-17
- Supersedes section 6.25 of DFRS Policy and Procedure #808, dated June 9, 1994







MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

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Driving and Crew Areas, Apparatus Body, and Compartmentation

The following defects and deficiencies of the driving and crew areas, the apparatus body, and the compartmentation reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Body mounting that is defective
- ☐ Cab mounting that is defective
- ☐ Seat belts that are torn or have melted webbing, missing or broken buckles, or loose mountings. Due to the extreme safety-related consequences of a defective seat belt, and the fact that one defective seat belt (unless it is the driver's seat belt) does not render a piece of apparatus unusable, the authority having jurisdiction shall take any seating position with a defective seat belt out of service. (All assigned riding positions must have operable seat belts.)
- ☐ Cracked or broken windshield that obstructs the driver's/operator's view
- ☐ Missing or broken rearview mirrors that obstruct the driver's/operator's view
- ☐ Windshield wipers that are missing or inoperable
- ☐ Steering wheel that has a deficiency affecting the drivability of the vehicle
- ☐ Oil pressure, engine, and/or transmission temperatures that can not be monitored or verified
- ☐ Speedometer that is inoperable
- ☐ Air gauge or audio low air warning device that has failed or is inoperable when air pressure < 60 psi (vehicles with air brakes)
- ☐ Door latches that are defective
- ☐ Defrosters that are inoperable
- ☐ Foot throttle that is inoperable



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Chassis, Axles, Steering and Suspension Systems, Driveline, Wheels, and Tires

The following defects and deficiencies of the chassis, axles, steering and suspension systems, driveline, wheels, and tires reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Tires that have cuts in the sidewall that penetrate to the cord
- ☐ Tires that have a tread depth of 4 /32 in. (3.2 mm) or less on any steering axle or 2 /32 in. (1.6 mm) or less on any non-steering axle at any two adjacent major tread grooves anywhere on the tire
- ☐ Any tire that is flat or has a detectable or audible leak
- ☐ On dual wheel tires: tires that are touching sidewall to sidewall when properly inflated
- ☐ Suspension components that are defective
- ☐ Wheel studs missing or loose wheel lugs
- ☐ Wheels that are cracked, bent, and/or broken that affect drivability
- ☐ Axle flanges that have Class 3 leakage
- ☐ An axle with a hub seal that has any Class 3 leakage or an empty reservoir
- ☐ Steering components that are defective affecting the vehicle handling
- ☐ A steering component that has Class 3 leakage
- ☐ Driveline components that are defective



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Operator's Guide to Fire Apparatus Out of Service Criteria

Engine Systems and Exhaust

The following defects and deficiencies of the engine systems reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Air filter restriction indicator that shows maximum restriction after resetting
- ☐ Engine system that has significant leakage of oil
- ☐ Engine that is overheating
- ☐ Oil that contains coolant
- ☐ Oil that is diluted with fuel
- ☐ A fuel system component that has Class 2 leakage of fuel
- ☐ Fuel tank, mountings, or straps that are defective
- ☐ Fuel cap is missing or does not seal to prevent spillage
- ☐ Stop-engine light that fails to turn off after engine is started
- ☐ Exhaust components are broken or hanging
- ☐ Exhaust components are that leaking causing exhaust fumes to enter the cab or patient compartment

Engine Cooling System

The following defects and deficiencies of the engine cooling system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Cooling system component that has Class 3 leakage
- ☐ Coolant that contains oil
- ☐ Radiator that is loose
- ☐ Cooling fan that is loose or cracked



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Operator's Guide to Fire Apparatus Out of Service Criteria

Transmission and Clutch

The following defects and deficiencies of the transmission and clutch reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Automatic transmission that overheats
- ☐ Automatic transmission that has a "Do not shift" light on
- ☐ Transmission fluid that contains engine coolant
- ☐ Transmission components that have Class 3 leakage of transmission oil

Low-Voltage, Line Voltage Electrical Systems, and Warning Devices

The following defects and deficiencies of the low voltage electrical system and the line voltage electrical system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Charging system that fails to maintain 12-volts
- ☐ Grounding and bonding of the line voltage electrical system that is defective
- ☐ Insufficient DOT lighting to clearly mark the vehicle
- ☐ Insufficient warning lighting to clearly indicate emergency response
- ☐ Turn-signal is inoperable
- ☐ There is not any operable audible DOT warning devices (at least either the electric horn or the air horn, if so equipped, must be operable)
- ☐ There are not any operable audible emergency warning devices (at least the electronic siren, or the mechanical siren, if so equipped, must be operable)



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

Braking Systems

Air Brake Systems

The following defects and deficiencies of the air brake system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service. Use the prescribed test procedure for a commercial driver's license to assist with determining out of service condition.

- ☐ Service brakes that have an air pressure drop of more than 2 psi (13.8 kPa) in 1 minute for single fire apparatus or more than 3 psi (20.7 kPa) in 1 minute for combination fire apparatus, with the engine stopped and the service brakes released
- ☐ Leak-down rate (time) of the applied side of the air brake that is more than 3 psi (20.7 kPa) in 1 minute for single fire apparatus or more than 4 psi (27.6 kPa) in 1 minute for combination fire apparatus, with the engine stopped and the service brakes applied
- ☐ Braking system components that are defective
- ☐ Braking operation that is ineffective
- ☐ Parking brake operation that is ineffective
- ☐ Air compressor that fails to build air pressure. The time to build air pressure from 50 psi to 90 psi should not exceed 3 minutes
- ☐ Air compressor that fails to maintain 80–90 psi (552–621 kPa) pressure in the system with the service brakes applied and the engine at idle, or air compressor that fails to fill the air system to the air compressor governor cutout pressure with the service and parking brakes released
 - The cut-out pressure should not exceed 135 psi
 - The cut-in pressure should not be less than 80 psi
- ☐ Antilock braking system (ABS) warning indicator that is activated upon checking chassis operator's manual to determine the indicator light's meaning. (The warning indicator generally indicates that ABS is inoperable and the vehicle should be driven as such.)



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Operator's Guide to Fire Apparatus Out of Service Criteria

Hydraulic Brake Systems

The following defects and deficiencies of the hydraulic brake system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Brake system components that have Class 2 leakage of brake fluid
- ☐ Friction surfaces, brake shoes, or disc brake pads that have grease or oil on them
- ☐ Braking operation that is ineffective
- ☐ Parking brake operation that is ineffective
- ☐ Brake warning light that is activated or brake pedal that falls away or drifts toward the flooring when brake pressure is applied
- ☐ Antilock braking system (ABS) warning indicator that is activated upon checking chassis operator's manual to determine the indicator light's meaning. (The warning indicator generally indicates that ABS is inoperable and the vehicle should be driven as such.)

Fire Pump System

The following defects and deficiencies of the fire pump system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Pump that will not engage
- ☐ Pressure control system that is not operational
- ☐ Pump transmission components that have Class 3 leakage of fluid
- ☐ Pump panel throttle that is defective
- ☐ Master gauges inoperable
- ☐ Discharge relief valve not operable
- ☐ Primer motor not operable
- ☐ Tank-to-pump valve leaks
- ☐ Water leak in continuous stream



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

Aerial Device Systems

The following defects and deficiencies of the aerial device and its systems reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- ☐ Power takeoff (PTO) that will not engage
- ☐ Stabilizer system that is defective
- ☐ Aerial device that is defective
- ☐ Hydraulic system components that are defective
- ☐ Cable sheaves that are defective
- ☐ Cables that are broken or frayed
- ☐ Aerial device that is structurally deformed
- ☐ Torque box structure or fasteners that are defective
- ☐ Turntable fasteners that are defective or missing
- ☐ Class 3 leakage from aerial components



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

Inspections

All inspections shall be conducted in accordance with the manufacturer's recommended procedures.

It shall be the responsibility of the authority having jurisdiction to develop and implement a schedule of service and maintenance for the fire apparatus, systems, and components described in this document, based on manufacturer's recommendations, local experience, and operating conditions.

Inspections shall be performed at least as frequently as the manufacturer's recommended intervals and when the fire apparatus or any component is suspected or reported to have defects or deficiencies.

All defects or deficiencies found during an inspection shall be repaired or corrected by a qualified person.

It shall be the responsibility of the authority having jurisdiction to develop written criteria for when the apparatus is to be taken out of service. The presence of defects and deficiencies that reduce the operational safety and performance of the apparatus below the level established in the 49 CFR, part 390, "Federal Motor Carrier Safety Regulations"; applicable federal, state, and local regulations; applicable nationally recognized standards; manufacturers' recommendations; and guidelines established by the fire department or its designated service and maintenance organization shall be considered when placing the apparatus out of service.

The apparatus shall be returned to service only after defects and deficiencies have been corrected.



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

Definitions

Adjust. To maintain or regulate, within prescribed limits, by setting the operating characteristics to specified parameters.

Alignment. To adjust components to bring about optimum or desired performance.

Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

Calibrate. To correlate the reading of an instrument or system of measurement with a standard.

Collector Rings. A means of transmitting electrical power to the aerial device turntable from the main power supply; usually, concentric rings made of brass that are contacted by brushes to make the transfer to the specific electrical functions.

Component. A constituent part of a mechanical or electrical device.

Defect. A discontinuity in a part or a failure to function that interferes with the service or reliability for which the part was intended.

Defective. Having a defect, or faulty, namely loose, broken, or missing.

Deformation. Abnormal wear, defects, cracks or fractures, warpage, and deviations from the original condition that would affect safe and correct operation.

Documentation. The process of gathering, classifying, and storing information.

Failure. A cessation of proper functioning or performance.

Fire Apparatus. A vehicle used for fire suppression or support by a fire department, fire brigade, or other agency responsible for fire protection.

Combination Fire Apparatus. A vehicle consisting of a pulling tractor and trailer.

Single Fire Apparatus. A vehicle on a single chassis frame.

Frame. The basic structural system that transfers the weight of the fire apparatus to the suspension system.

Inspect. To determine the condition or operation of a component(s) by comparing its physical, mechanical, and/or electrical characteristics with established standards, recommendations, and requirements through examination by sight, sound, or feel.

Interlock. A device or arrangement by means of which the functioning of one part is controlled by the functioning of another.



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Operator's Guide to Fire Apparatus Out of Service Criteria

Ironing. Damage in the form of wear or indentations caused to the bottom of the aerial device base rail material by misalignment or malfunction of the rollers.

Leakage. The escape of a fluid from its intended containment, generally at a connection. The three classes of leakage are defined.

Leakage, Class 1. Seepage of fluid, as indicated by wetness or discoloration, not great enough to form drops.

Leakage, Class 2. Leakage of fluid great enough to form drops, but not enough to cause drops to fall from the item being inspected.

Leakage, Class 3. Leakage of fluid great enough to cause drops to fall from the item being inspected.

Maintenance. The act of servicing a fire apparatus or a component within the time frame prescribed by the authority having jurisdiction, based on manufacturer's recommendations, local experience, and operating conditions in order to keep the vehicle and its components in proper operating condition.

Preventive Maintenance. The act or work of keeping something in proper condition by performing necessary preventive actions, in a routine manner, to prevent failure or breakdown.

Manufacturer's Recommendation (Specification). Any requirement or suggestion a fire apparatus builder or component producer makes in regard to care and maintenance of its product(s).

Modification. An alteration or adjustment to any component that is a deviation from the original specifications or design of the fire apparatus.

Operator Alert Device. Any device, whether visual, audible, or both, installed in the driving compartment or at an operator's panel, to alert the operator to either a pending failure, an occurring failure, or a situation that requires his or her immediate attention.

Optical Source. Any single, independently mounted, light-emitting component in a lighting system.

Overhaul. To inspect, identify deficiencies, and make necessary repairs to return a component to operational condition.

Power Train. The parts of a fire apparatus that transmit power from the engine to the wheels, including the transmission, split shaft power takeoff, midship pump transmission, drive shaft(s), clutch, differential(s), and axles.

Powered Equipment Rack. A power-operated device that is intended to provide storage of hard suction hoses, ground ladders, or other equipment, generally in a location above apparatus compartments.

Proper. As recommended by the manufacturer.



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Operator's Guide to Fire Apparatus Out of Service Criteria

Qualified Person. A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work, or project.

Repair. To restore to sound condition after failure or damage.

Replace. To remove an unserviceable item and install a serviceable counterpart in its place.

Severe Service. Those conditions that apply to the rigorous, harsh, and unique applications of fire apparatus, including but not limited to local operating and driving conditions, frequency of use, and manufacturer's severe service (duty) parameters.

Shall. Indicates a mandatory requirement.

Should. Indicates a recommendation or that which is advised but not required.

Steering Axle. Any axle designed such that the wheels have the ability to turn the vehicle.

Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

Operational Test. A test to determine the operational readiness of a component on a fire apparatus by observing the actual operation of the component.

MCFRS EMS Stretcher/Stair Chair Incident Reporting Protocol

The following protocol should be used to investigate, report, and document cases in which an incident occurs involving an EMS Stretcher or EMS Stair Chair. This includes patient drops, mechanic/human failures, equipment malfunctions, or complaints etc.

- ☐ The EMS Stretcher or EMS Stair Chair will be immediately placed out of service. Request additional resources as necessary.
- ☐ Immediately report the incident to the affected station supervisor.
- ☐ The EMS Duty Officer and the Safety Officer will initiate a cooperative investigation to determine and document facts and obtain statements.
- ☐ The Safety Officer is responsible for completing an Rmap (Loss) report (General Liability) to document the incident so a claim can be generated and sent to VFIS. The device photos, model number, and serial number are required. The associated apparatus information (photos, VIN number, unit number, stock number) must also be documented in the report. This must be completed within 24-hours of the incident.
- ☐ The EMS Duty Officer will work with the Safety Officer to attach any EMS procedural QA findings to the Rmap. This way all documents are located in one location. Attachments are not part of the claim to VFIS unless specifically requested.
- ☐ The Safety Officer will ensure that the affected Battalion Chief is updated and communicate what resource deficiencies need to be addressed to return the unit to service.
- ☐ The EMS Stretcher or EMS Stair Chair will be clearly marked OOS and identified as being involved in a potential failure requiring follow-up by the Public Safety Logistics (PSL) section staff.
- ☐ The station supervisor will enter a defect report to include the unit, device, serial number, and model number.
- ☐ The EMS Stretcher or EMS Stair Chair will be delivered to PSL Door A-9 during normal business hours. Outside of normal business hours the device will be delivered to the PSL reserve apparatus bay. The Safety Officer will make sure the PSL staff understand the device was involved in a potential failure incident and the proper documentation, reporting, inspection, and follow-up is required.
- ☐ A PSL and FERNO approved vendor will perform the necessary inspection/repairs and if necessary complete the MEDWatch report.
- ☐ PSL staff will provide a completed copy of the inspection/repair work order to the Safety Officer to be attached to the associated Rmap.
- ☐ If there was an actual failure, PSL staff will provide a copy of the inspection/repair work order and the Ferno MedWatch report to the EMS Chief for verification purposes.
- ☐ Once all follow-up documentation and fact finding is complete, the Safety Officer in cooperation with the EMS Duty Officer will update Rmap's Investigators Findings & Recommended Corrective Actions.
- ☐ Any questions should be directed to the Health & Wellness Assistant Chief



MONTGOMERY COUNTY FIRE AND RESCUE SERVICES

Apparatus Checkout Sheet

Fire Station:

Unit Number:

Month of:

County Stock Number:

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200__

Daily Items	Weekly Items (+ Daily)	Monthly Items (+ Daily & Weekly)
<ul style="list-style-type: none"> ◆ Check vehicle for damage. ◆ Check engine & transmission fluid levels. ◆ Visually inspect tires for defects & proper inflation. ◆ Inspect engine compartment hoses for: <ul style="list-style-type: none"> • Cracks, bulges and leaks ◆ Inspect fan and accessory belts for: <ul style="list-style-type: none"> • Cracks and appropriate tension ◆ Operate inverter/motor generator. ◆ Check all lights, warning devices, & signaling equipment. ◆ Change portable radio battery. ◆ Portable radio count. ◆ Check radio volume & appropriate talkgroup. ◆ Inventory & check all SCBA (FILL IF BELOW 4500psi). *** (Note completion of SCBA inspection on the SCBA inspection sheet) *** ◆ Test: <ul style="list-style-type: none"> • A.E.D. (If Applicable) • Gas Track • CO Monitor • Heat Detector ◆ Check portable fire extinguishers. ◆ Check fluids on all gas-powered equipment. ◆ Inspect cab area for: <ul style="list-style-type: none"> • Map books • Fuel card • Hand lights • Knox Box Key • Command Action Guides. ◆ Visual inventory of all equipment. ◆ Secure hose loads. ◆ Visually inspect water & foam tanks. ◆ Engage pump & pump accessories. ◆ Actuate pump primer. ◆ Set up aerial device, inspect outriggers & aerial & ladder's for damage & operability ◆ Elevate, rotate & extend aerial. ◆ Check all fluids and operate diesel generator for at least 10 minutes. ◆ Check all E.M.S. equipment. ◆ Check all O² levels. ◆ Check cot for proper operation. Is it yours? 	<ul style="list-style-type: none"> ◆ Visually inspect battery terminals. ◆ Check for correct tire pressure. ◆ Operate all pump valves (from stop to stop), drains & caps. Lubricate as required. ◆ Exercise discharge relief valve. ◆ Verify unit inventory. ◆ Tighten loose equipment fasteners or brackets. ◆ Clean portable equipment as required. Paint, lubricate and label as needed. ◆ Operate all electrically powered equipment & accessories. ◆ Operate all gas-powered equipment & accessories for 5 minutes. ◆ Clean cab and bucket areas. ◆ Operate all hydraulic rescue tools. ◆ Clean/Disinfect all E.M.S. equipment. ◆ Clean/Disinfect stretcher & patient compartment. ◆ Rotate AED & suction unit batteries. 	<ul style="list-style-type: none"> ◆ All compartments are to be cleaned, dried & reassembled as needed. ◆ Check for: <ul style="list-style-type: none"> • Frayed wiring • Compartment lighting • Condition of door seals • Hinges • Strikers • Latches ◆ Replace damaged maps as necessary. ◆ Perform a monthly SCBA inventory and log in the station SCBA maintenance book. ◆ Remove any ladders, clean completely & lubricate slides & hardware with a manufacturers' recommended lubricant. ◆ Aerial Devices: Clean and lubricate according to the manufacturers' instructions, or at a minimum, quarterly. ◆ Back flush pumps according to the manufacturers' instructions. ◆ With supply from hydrant (soft sleeve) check operation of: <ul style="list-style-type: none"> • Front intake • Tank fill valve • Transfer valve • Visually inspect for excessive leaks. ◆ Perform operational check of on-spot chains. ◆ Perform dry prime test. ◆ Inspect suction screens. ◆ Operate swing check valves on all two-stage pumps. ◆ Monitor pump packing for excessive leaks. ◆ Lubricate suction threads with a light coat of grease.

**** NOTE ****

Refer to NFPA 1915, Standard for Fire Apparatus Preventive Maintenance Program as a guideline when placing apparatus "Out of Service".

Apparatus drivers must sign by putting their ID #. Each shift officer must sign by writing their ID # at the end of each month to assure their shifts' compliance. Signing indicates that the apparatus was checked according to the above guidelines.

D = Daily W = Weekly M = Monthly (Circle Applicable Letter Under "Type" Column)[Mark O.O.S. if unit is Out of Service]

ID #	Type	ID #	Type	ID #	Type	ID #	Type	ID #	Type	
1	D W M	8	D W M	15	D W M	22	D W M	29	D W M	SHIFT OFFICER's ID #
2	D W M	9	D W M	16	D W M	23	D W M	30	D W M	A
3	D W M	10	D W M	17	D W M	24	D W M	31	D W M	B
4	D W M	11	D W M	18	D W M	25	D W M	** REMINDER ** Send apparatus mileage to the Safety Office on the first day of the month.		C
5	D W M	12	D W M	19	D W M	26	D W M	Mileage: (Beginning of Month)		
6	D W M	13	D W M	20	D W M	27	D W M	Mileage: (End of Month)		
7	D W M	14	D W M	21	D W M	28	D W M	Mileage: (TOTAL for Month)		

MCFRS Apparatus Checkout Sheet		Unit number:		Page 2	
Date	Fluid(s) Added? (List Type & Amount Added)	Mileage	Problems/Body Damage Noted	Shop Ticket Written (Circle One)	
1				YES	NO
2				YES	NO
3				YES	NO
4				YES	NO
5				YES	NO
6				YES	NO
7				YES	NO
8				YES	NO
9				YES	NO
10				YES	NO
11				YES	NO
12				YES	NO
13				YES	NO
14				YES	NO
15				YES	NO
16				YES	NO
17				YES	NO
18				YES	NO
19				YES	NO
20				YES	NO
21				YES	NO
22				YES	NO
23				YES	NO
24				YES	NO
25				YES	NO
26				YES	NO
27				YES	NO
28				YES	NO
29				YES	NO
30				YES	NO
31				YES	NO



MONTGOMERY COUNTY FIRE AND RESCUE SERVICES

SCBA Daily Checkout Sheet

Fire Station:

Unit
Number:

Page 1

County
Stock
Number:

200

Sign by putting the persons ID # next to the SCBA they checked

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers
1	ID #		12	ID #		22	ID #	
2			13			23		
3			14			24		
4			15			25		
5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers
1	ID #		12	ID #		22	ID #	
2			13			23		
3			14			24		
4			15			25		
5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	• 4500 PSI • Regulator • Service Check • Pass Device	Are you using a spare ??? Indicate Regulator & Reducer Numbers
1	ID #		12	ID #		22	ID #	
2			13			23		
3			14			24		
4			15			25		
5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					



MONTGOMERY COUNTY FIRE AND RESCUE SERVICES

SCBA Daily Checkout Sheet Fire Station:

Unit
Number:

County
Stock
Number:

Page 2

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Sign by putting the persons ID # next to the SCBA they checked

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers
1	ID #		12	ID #		22	ID #	
2			13			23		
3			14			24		
4			15			25		
5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers
1	ID #		12	ID #		22	ID #	
2			13			23		
3			14			24		
4			15			25		
5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					

SCBA Position _____			SCBA Reducer Serial #:			SCBA Regulator #:		
Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers	Day	<ul style="list-style-type: none"> 4500 PSI Regulator Service Check Pass Device 	Are you using a spare ??? Indicate Regulator & Reducer Numbers
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5			16			26		
6			17			27		
7			18			28		
8			19			29		
9			20			30		
10			21			31		
11			Complete Monthly Disinfections, Cleaning and Inspection					

BLS UNIT INVENTORY

New Units

Unit: _____

Month: _____

Stock #: _____

WK1	WK2	WK3	WK4	WK5	MIN	INVENTORY OF INTERIOR COMPARTMENTS
						DRIVER REAR
					2	Head immobilization device *
					2	Spider straps *
					2 ea	Adjustable extrication collars (adult, pediatric) *
					2	Towels *
					2	Straps - 9"
					2	Trauma dressing - 10 x 12 *
					4	Trauma dressing - 8 x 10 *
					1 box	Trauma dressing - 4 x 4 (24 min) *
					6	Kling - 3" *
					6	Kling - 6" *
					8	Triangular bandages *
					2	Tape (hypo-allergenic type) - 1"
					2	Tape (hypo-allergenic type) - 2" *
					8	Cold packs *
					2	Heat packs (<140 degrees)
					1 box	Band-aids - 1"
					1	Commercial tourniquet *
					2	Asherman seal or material for occlusive dressing *
					2	Chux type pads
					2	OB kits (commercial kits) *
					2	Silver swaddler or baby bunting type material
					2	Burn sheets (mylar) *
					4 ea	N-95 masks - uni-size *
					1 ea	B/P cuffs (adult, child, obese, infant) *
					3	Surgical mask (one for each person on unit) *
					3	Gowns (impenetrable to blood and/or body fluids)
						AIRWAY COMPARTMENT (DRIVER FRONT)
					2	Non-rebreather O2 masks with tubing *
					2	Non-rebreather O2 masks with tubing - pediatric *
					2	Nasal cannula *
					2	Nasal cannula - pediatric *
					2	Oxygen connecting tubing
					2	Nebulizers
					1 ea	Nebulizer aerosol mask - adult and pediatric
					1	Tracheotomy mask - adult
					2	Disposable suction container
					1	Suction catheter - 10fr *
					1	Suction catheter - 14fr *
					2	Suction tubing
					1	Suction wand - rigid Yankauer type *
					1	Bag valve - adult with #5 cuffed face mask *
					1	Bag valve - child with #2 cuffed face mask *
					1	Bag valve - infant with #0 cuffed face mask *
					1 ea	Transparent face mask (size 00, 1, 3, 4) *
					1	Oral pharyngeal airway #00 40mm pink *
					1	Oral pharyngeal airway #0 50mm light blue *
					1	Oral pharyngeal airway #1 60mm black *
					1	Oral pharyngeal airway #2 70mm white *
					1	Oral pharyngeal airway #3 80mm green *
					1	Oral pharyngeal airway #4 90mm yellow *
					1	Oral pharyngeal airway #5 100mm lavender *
					1	Oral pharyngeal airway #6 110mm orange *
					1 set	Nasal airways and lubricant (20fr [4.0mm] to 36fr [8.0mm]) (1 set is 5 sizes) *
					6	Surgical lubricants

Items with an *asterisk are required by the MIEMSS Minimum Equipment Standard and must be on the unit at all times.

BLS UNIT INVENTORY

New Units

						AIRWAY STATION
					1	Oxygen flow meter *
					1	Disposable central suction canister (on-board) *
					1	Suction tubing & yankauer type wand *
					1	Trauma scissors *
					2	Emesis basin or convenience bag *
					1	Penlight *
					4	Eye protection *
					1	Box of facial tissue *
					1	Bite stick (tongue depressor)
					1	Alcohol based hand cleaner *
					1	Stethoscope (must be pediatric capable) *
					1	Ring cutter *
					1	Baby wipes
WK1	WK2	WK3	WK4	WK5	MIN	OFFICER SIDE UPPER COMPARTMENT (ABOVE BENCH)
					4	Sheets *
					2	Blankets *
					5	Red hazardous waste bags *
					1	Disinfectant spray can
					1	Disinfectant wipes (OSHA standards: kills HBV, HIV, TB) *
					1 ea	Latex free gloves - 1 box each small, medium, large, x-large (above door) *
						ALS DRAWER (TOP)
					2	Lactated ringers solution 1000cc
					2 ea	Drip set ("macro" 10/15/20 drop and "micro" 60 drop)
						ALS DRAWER (BOTTOM)
					2	IV safety catheter - 14ga
					2	IV safety catheter - 16ga
					2	IV safety catheter - 18ga
					2	IV safety catheter - 20ga
					2	IV safety catheter - 22ga
					2	IV safety catheter - 24ga
					2	Veni-gard/tegaderm or comparable
					1	Vacutainer holder
					1 set	Set of blood tubes (red, marble, purple, blue, green)
					10	Alcohol preps
					5	Betadine preps
					2	Constricting bands
					1	Constricting bands - latex free
					4	Trauma dressing - 4 x 4
					1 roll	Tape (hypo-allergenic type) - 1"
					1	Safety needles - 18ga
					1	Safety needles - 21ga
					1	Safety needles - 25ga
					1	Syringe - 10cc, luer lock type
					1	Syringe - 5cc, luer lock type
					1	Syringe - 3cc, luer lock type
					2	Syringes - 1cc, luer lock type
					1	Extension set for saline locks
					2	Safety needle - Twin Pak
						BLS PULL OUT TRAY
					3	Instant glucose (15 grams per)
					2	Activated charcoal (100 gm) *
					4	Acetaminophen (160mg/5ml single unit dose) *
					1	Epi kit
					1	Aspirin (children's 81mg dosage) - bottle
					2	Sterile water/saline (1000 cc per) *
					2	AED/LP15 pads - adult remote disposable - Physio brand *
					1	AED pads - pediatric reduced energy - Physio brand (pink connector on front) *
					1 roll	Tape (hypo-allergenic type) - 1" *
					10	MIEMSS short forms *
					2	Latex free gloves (various sizes)
					1	Temporal thermometer *
					1	State protocol book or electronic version (on ePCR)

Items with an *asterisk are required by the MIEMSS Minimum Equipment Standard and must be on the unit at all times.

BLS UNIT INVENTORY

New Units

					FORWARD COMPARTMENT (WITH REMOVABLE NETTING)	
					1	Portable suction unit *
					1	Tubing with Yankauer wand type *
					1	Suction catheter - 10fr *
					1	Suction catheter - 14fr *
					1	Bottle of sterile water
					1	Charging cord
					1	AED *
					2	AED/LP15 pads - adult remote disposable - Physio brand *
					1	AED pads - pediatric reduced energy - Physio brand (pink connector on front) *
					1	Razor *
					1	Green aide bag
					2	Traffic safety vests *
						UNDER DRIVER SIDE BENCH SEAT
					4	Bio-hazard protection kits *
					5	Red hazardous waste bags *
					2 sets	Soft restraints *
WK1	WK2	WK3	WK4	WK5	MIN	UNDER OFFICER SIDE BENCH SEAT
					2 sets	Padded board splints (15" and 36") *
					2	Adjustable traction splint (optimum traction device) *
					2	Body bags
					1	Pedi-mate child restraint
						SIDE ENTRANCE FOOTWELL
					2	Spare O2 cylinders - Jumbo D 640L *
						PATIENT CARE AREA
					1	Stretcher *
					1	Aide/O2 bag (see attached for detailed inventory)
					2	Mounted sharps containers *
					1	"No Smoking" sign *
					2	Trash can (covered and secured) *
						CAB
					2	Portable radios
					1	GPS navigation unit
					1	EZ Pass
					1	Daily check-out book/monthly inventory sheets
					1	Haz-Mat guide - DOT emergency response guide (latest version) *
					1	Knox-Box key (if not on aide bag)
					1	Remote door control
					1 set	Map books (surrounding stations)
					1	Vehicle registration
					1	MDT
					1	PAS ring
					2	Traffic safety vests *
					2	Latex free gloves (various sizes)
					10	Rehab forms
						INVENTORY OF EXTERIOR COMPARTMENTS
						DRIVER FRONT
					1	"M" bottle O2 (at least 300 psi) *
					1	Reeves type stretcher
					2	54" padded board splints *
					1	Wheel chock (mounted underneath)
					1	Mega mover
						DRIVER CENTER
					1	Trash can
					1	Convertible safety seat (infant/child) *
						DRIVER REAR
					2	45 minute SCBA
					2	Rechargeable handlights *
					1	Driver's gear
					1	Officer's gear

Items with an *asterisk are required by the MIEMSS Minimum Equipment Standard and must be on the unit at all times.

BLS UNIT INVENTORY

New Units

OFFICER FRONT (PASS-THROUGH TO INTERIOR COMPARTMENT)						
					Same as "forward compartment (with removable netting)"	
				1	Fire extinguisher - 10lb. ABC *	
				1	Hazardous reflector triangle set (3) *	
				1	Tool box:	
				1 ea	S M L flat screwdriver	
				1 ea	S M L philips screwdriver	
				1	Pliers, 8" channel lock	
				1	Pliers, 10" vise grip	
				1	Wrench, 12" open ended	
				1	Side-nose cutting pliers	
				1	Hammer, 3 lb	
				1	Spring loaded punch	
				1	Bolt cutter	
WK1	WK2	WK3	WK4	WK5	MIN	OFFICER CENTER
						Extrication Bag:
					2	Tape - 2"
					2	Kling - 3"
					2	Kling - 6"
					4	4 x 4
					4	Cravats *
					2	Adjustable extrication collars - adult
					2	Adjustable extrication collars - pediatric
					1	Head immobilization device
					1 set	Spider straps *
					2	Towels, sheets, or padding
					1	Trauma scissors
					1	Eye protection
					1	Center punch
						OFFICER REAR
					2	Triage kits(fanny packs): *
					25 ea	Triage ribbons (red, yellow, green, black) *
					25	Triage tags *
					2	CAT Tourniquets
					2	Fine tip black sharpie pens
					2	Ausherman seals *
					4	Emergency bandages *
					1	Trauma scissors
					2	Sharpies - black, fine tip
					2	Backboards *
					1	Pediatric immobilization device
					1	Half backboard plastic or KED *
					1	Stair chair *
					1	Orthopedic frame (scoop)
					1	Quik Litter

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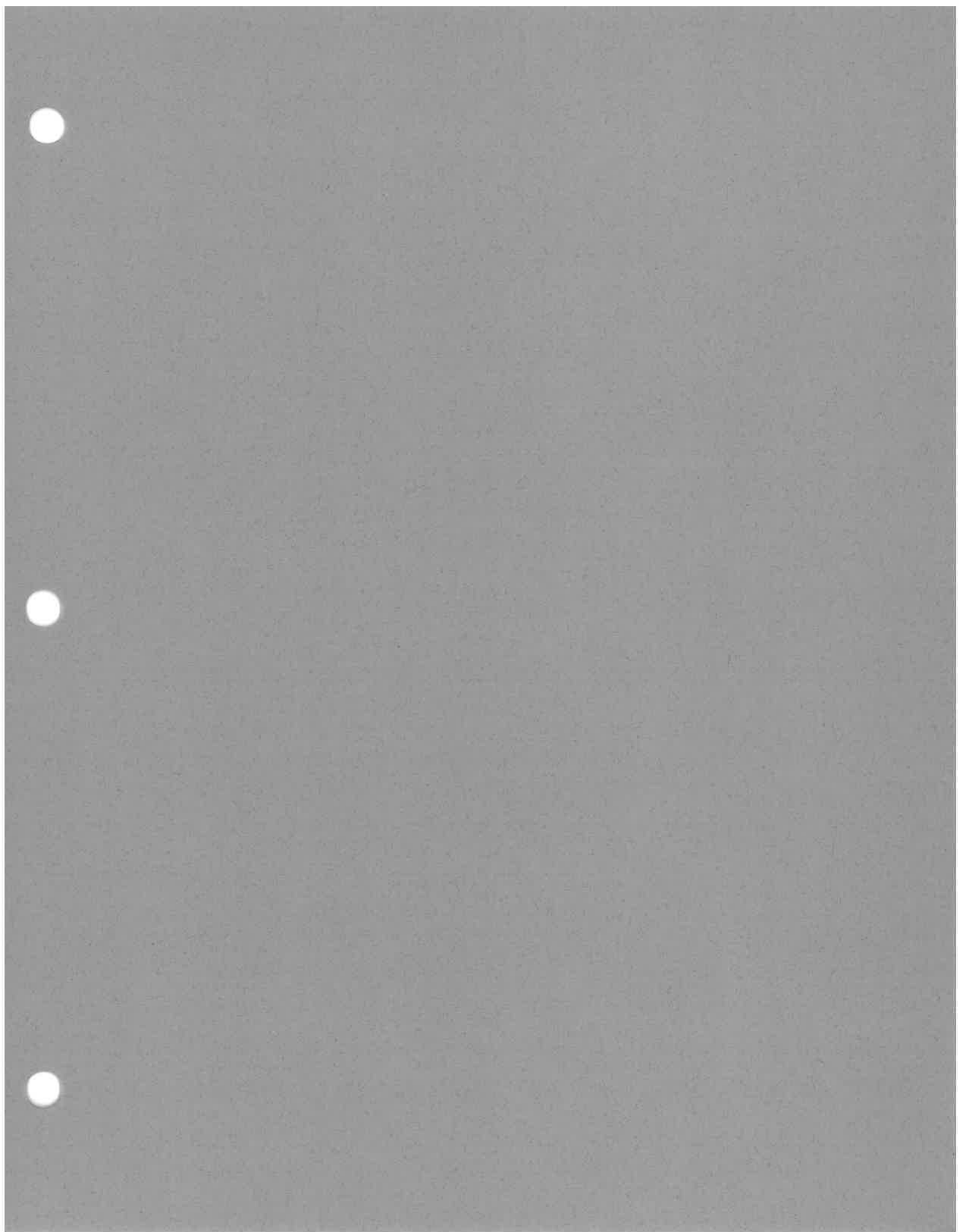
Items with an *asterisk are required by the MIEMSS Minimum Equipment Standard and must be on the unit at all times.

BLS UNIT INVENTORY

New Units

WK1	WK2	WK3	WK4	WK5	MIN	AIDE/OXYGEN BAG
					2	Pelican cases:
					1	Glucometer precision H test meter and test strips *
					4	Acetaminophen (liquid form, 160mg/5ml single unit dose) *
					1	Aspirin bottle 81 mg, chewable *
					2	Glucose paste *
					1	Epi kit (1cc syringe, 1:1000 ampule of epi, (2) 25ga 1" safetyglide needle) *
					1	Naloxone (narcane) - 4mg total *
					2	Intranasal medication delivery device (atomizer) *
					1	Jumbo D oxygen bottle 640L (at least 300 PSI) *
					1	Nasal cannula - adult *
					1	Nasal cannula - pediatric *
					1	Non-rebreather mask - adult *
					1	Non-rebreather mask - pediatric *
					1	Oral pharyngeal airway #00 40mm pink *
					1	Oral pharyngeal airway #0 50mm light blue *
					1	Oral pharyngeal airway #1 60mm black *
					1	Oral pharyngeal airway #2 70mm white *
					1	Oral pharyngeal airway #3 80mm green *
					1	Oral pharyngeal airway #4 90mm yellow *
					1	Oral pharyngeal airway #5 100mm lavender *
					1	Oral pharyngeal airway #6 110mm orange *
					1 set	Nasal airways and lubricant (20fr [4.0mm] to 36fr [8.0mm]) (1 set is 5 sizes) *
					6	Water soluble lubricant packs *
					1	Bite stick
					1	Pulse oximeter - adult and pediatric sensor *
					1	Bag-valve - adult with #5 cuffed face mask *
					1	Bag-valve - child with #2 cuffed face mask *
					1	Bag-valve - infant with #0 cuffed face mask *
					1	Stethoscope (must be pediatric capable) *
					1	BP cuff - regular *
					1	BP cuff - large
					2	Kling - 3" *
					2	Kling - 6" *
					2	Multi-trauma dressing - 10 x 12 *
					6	4 x 4 *
					2	Tape (hypo-allergenic type) - 2" *
					1	Trauma scissors *
					1	Penlight *
					6	Gloves (pairs) *
					2	Eye protection *
					1	Commercial (CAT) tourniquet *
					1	Sharps container *
					1	Portable environmental CO alarming device *

Items with an *asterisk are required by the MIEMSS Minimum Equipment Standard and must be on the unit at all times.





Montgomery County Fire and Rescue Service FIRE CHIEF'S GENERAL ORDER

NUMBER: 15-16

November 16, 2015

Page 1 of 3

TO: All MCFRS Personnel
FROM: Fire Chief Scott E. Goldstein
SUBJECT: Triage Proficiency



This FCGO replaces and rescinds FCGO 14-13 (revised).

Effective November 17th, 2015, MCFRS will dedicate one full week every March and September (the third Sunday to the following Saturday) to using the tools of effective MCI management. The program will concentrate on the *START* and *JumpSTART* triage systems and components of the Incident Command System on expanding EMS incidents.

All personnel must review the Maryland Triage System presentation and documents before beginning the week-long requirements. The Maryland Triage System Training, as well as supporting documents, can be found at www.MIEMSS.org under the "Documents" tab. The preferred training platform is company level or Battalion-based, but personnel can review the training individually.

During the seven day periods (Sunday to Saturday) from 0700 to 1700, all personnel will apply the skills listed on the *MCI Monday Benchmarks* (attached) as a minimum on **EVERY** EMS incident (including single patient events).

All personnel are encouraged to frequently review triage procedures. Nothing prohibits supervisors from requiring these tasks on additional days, incidents or training events.

Personnel are also reminded of the following MCI guidelines:

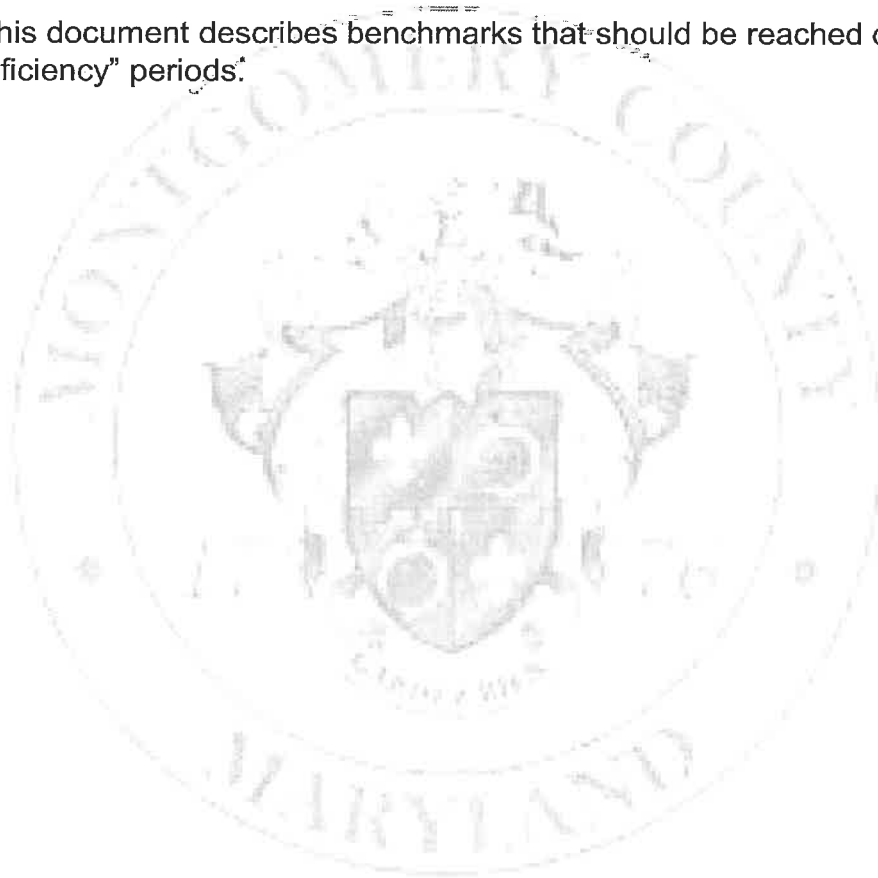
- Consider expanding the EMS Group on incidents with five or more patients. This may include establishing Casualty Collection Points, Treatment Unit Leaders/Areas, Medical Communications Coordinator, Transportation Unit Leader, or other positions.
- Use the Transportation/Disposition Officer Log and Patient Tracking Log on incidents with five or more patients and ensure you affix the appropriate label to the document.

For questions or further clarification about the process or requirements, contact the on-duty EMS Duty Officer or the EMS Section.

FCGO 15-16
November 16, 2015
Page 2 of 3

To assist with MCI training, each EMS Duty Officer (EMSDO) has been provided with a Mass Casualty Incident Training Kit. These kits include treatment area tarps, tags, ribbons, forms, and inflatable "patients". Requests to use these kits may be coordinated through the EMSDO responsible for the shift and geographical area for the requesting station.

Page 3 of this document describes benchmarks that should be reached during "Triage Proficiency" periods.



FCGO 15-16
November 16, 2015
Page 3 of 3

MCFRS “Triage Proficiency” Benchmarks

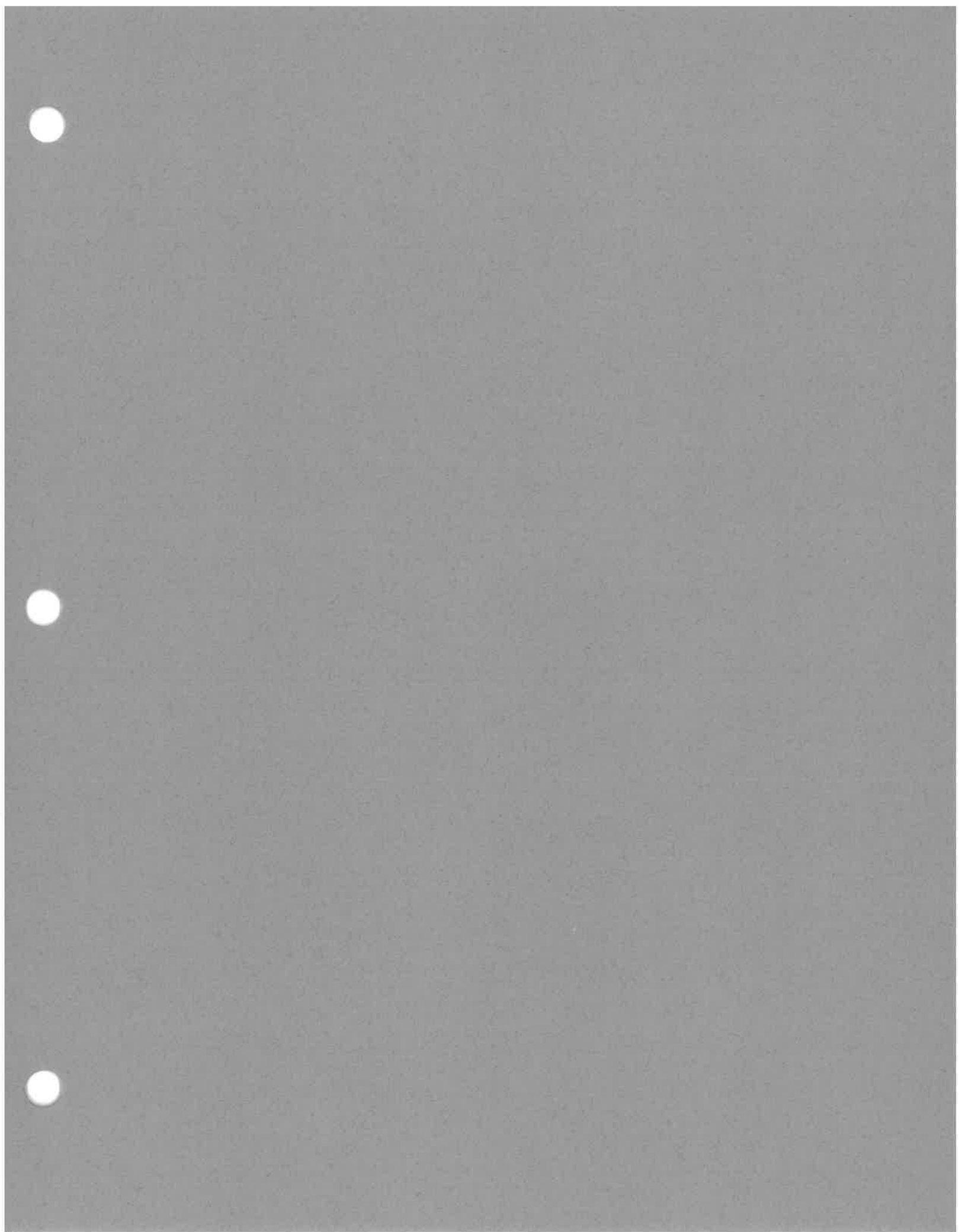
On every EMS incident from 0700 – 1700 during the third full week of March and the third full week of September:

- ☐ Within the first minute of patient contact:
 - Perform Primary Triage using the START/JumpSTART system.
 - Apply the appropriate colored triage ribbon based on the triage decision.
- ☐ Before loading the patient into the transport unit, attach a Maryland Triage tag using the ribbon to the upper part of the body (e.g. an arm). At a minimum, the information on the tag must include patient name, chief complaint, and vital signs.
- ☐ Before going in service from the scene, personnel from the primary manpower piece on the call must obtain the transport stub from the triage tag and place it upon a Transportation/Disposition Officer Log. A separate form must be used for each receiving hospital transported.
- ☐ The triage tag number must be noted in the ePCR/eMEDs (or successor system) report using the designated field. Use of the triage tag does not eliminate the requirement to complete an ePCR for each patient.
- ☐ Before leaving the hospital, obtain a bar code sticker from the triage tag, and place it on a Patient Tracking Log form in the patient column. Circle the status column (RYGB). Each transport unit should only have one Patient Tracking Log per day.

All sections on each document must be completed and include the station/unit and date of service in the upper margin.

At the end of the shift, the station officer will collect the completed Logs from each piece of apparatus and mail them via interoffice mail to the Battalion Chief. If no patient contacts were made by a unit that day, this information should be emailed to the Battalion Chief. After verifying that the forms were complete, the Battalion Chief shall organize and mail the forms to the EMS Assistant Chief.

The document handling for volunteer staffed units will be managed by the LFRD Chief or designee. After LFRD review, completed documents must be submitted to the Assistant Chief of the EMS Section.





MONTGOMERY COUNTY FIRE AND RESCUE SERVICE



INFECTION CONTROL PLAN

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FACILITY NAME:	
DEPARTMENT NAME:	Montgomery County Fire and Rescue Service
DATE OF PREPARATION:	
DATES OF LAST REVIEW and UPDATE:*	

* *Must be revised annually.*

MISSION STATEMENT

Montgomery County Fire and Rescue Service is committed to providing a safe and healthful work environment for all personnel. The Infection Control Plan (ICP) has been developed and implemented to eliminate or minimize the risk of occupational exposure to communicable diseases such as Blood-Body Fluid Contact Diseases, Airborne Diseases, and Droplet Diseases, in accordance with the OSHA standard titled "Occupational Exposure to Bloodborne Pathogens," codified at 29 CFR 1910.1030 and NFPA 1581, *Fire Department Infection Control Program*.

The ICP is a key document to ensure compliance with the standard and to protect our employees. This Infection Control Plan includes:

- Determination of employee exposure,
- Implementation of various methods of exposure control including:
 - Universal precautions,
 - Engineering and work practice controls,
 - Personal protective equipment,
 - Housekeeping,
- Hepatitis B vaccination,
- Post-exposure evaluation and follow-up,
- Communication of hazards to employees and training,
- Recordkeeping,
- Procedures for evaluating circumstances surrounding an exposure incident, and
- Procedures for applying the plan to Volunteer employees.

DEFINITIONS

Important terms used in this document are listed below. Additional definitions are available in the Bloodborne Pathogens standard. A copy of the standard is available on the OSHA web site at http://www.osha.gov/pls/osha/web/owadisp.show_document?p_table=STANDARDS&p_id=10051.

AIRBORNE PATHOGENS - is any disease that is caused by pathogens and transmitted through the air, which can include emerging infectious diseases.

BLOOD- is defined as human blood human blood components and products made from human blood.

BLOODBORNE PATHOGENS - is defined as pathogenic microorganisms that are present in human blood and can cause disease in humans, which can include emerging infectious diseases.

CMF- Acronym for Central Maintenance Facility

EMERGING INFECTIOUS DISEASE (EID)- is an infectious disease whose incidence has increased in the recent past and is likely to continue in the near future.

EMPLOYEE- All operational and administrative individuals of the Montgomery County Fire and Rescue Services

EMS- Acronym for Emergency Medical Service

ENGINEERING CONTROL- is defined as a means of implementing a control measure to isolate or remove a specific hazard from the workplace.

EXPOSURE INCIDENT or **EXPOSURE**- is defined as a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

FROMS- Acronym for Fire and Rescue Occupational Medical Services

HAND_WASHING- performing hand hygiene after handling contaminated equipment, and clothing, and before and after taking off gloves during patient contact will reduce the exposure risks to blood borne pathogens

MCFRS- Acronym for Montgomery County Fire & Rescue Service

OCCUPATIONAL EXPOSURE- means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

OTHER POTENTIALLY INFECTIOUS MATERIALS (OPIM) means: (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, **any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids**; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue, cultures, organ cultures, and HIV- or HBV-containing culture, medium, or other solutions; and blood organs or other tissues from experimental animals infected with HIV or HBV.

PSTA- Acronym for Public Safety Training Academy

REGULATED WASTE means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

SCBA- Acronym for Self-Contained Breathing Apparatus

UNIVERSAL PRECAUTIONS - is a risk assessment size up that all providers take prior to making patient contact. All patients' body fluids and blood will be treated as being infectious. This risk analysis helps the provider determine what minimum level of BSI (gloves, gowns, face shield, N95 Mask, goggles, hair covering, shoe covers,) will be used.

WORK PRACTICE CONTROL is defined as a means of implementing a control measure which will reduce employee exposure by altering the manner in which a task is performed in the workplace.

PROGRAM ADMINISTRATION

- The MCFRS along the Montgomery County Department of Finance Division of Risk Management and in collaboration with Medical Access or other Licensed Healthcare Provider Occupational Medical Services (OMS) and Fire and Rescue Occupational Medical Service (FROMS for Fire and Rescue Services only) are responsible for the implementation of the ICP. **Contact location/phone numbers: FROMS at (240) 777-5083.**
- The MCFRS Division of Risk Reduction & Training Services will maintain, review, and update the ICP at least annually and whenever necessary to include new or modified tasks and procedures. **Contact location/phone numbers: Safety Chief at (240) 777-2219 / Wellness Battalion Chief at (240) 777-5083.**
- The employees who Risk Management and/or FROMS have determined to be "high risk" or to have reasonably anticipated occupational exposure to blood or Other Potentially Infectious Materials (OPIM) must comply with the procedures and work practices outlined in this ICP.
- The MCFRS EMS Section Logistics (EMS Logistics) personnel will maintain and provide all necessary Personal Protective Equipment (PPE) and engineering controls (e.g., sharps containers, labels, and red bags as required). **Contact Location/Phone Number: EMS Resource Manager at (240) 777-2401.**
- EMS Logistics will ensure that adequate supplies of the aforementioned equipment are available in the appropriate sizes. **Contact Location/Phone Number: EMS Resource Manager at (240) 777-2401.**
- FROMS or the Licensed Healthcare Provider of Choice is responsible for ensuring that all medical actions required are performed and that appropriate employee health and OSHA records are maintained. **Contact location/phone number: FROMS at (240) 777-5185.**
- The MCFRS Division of Risk Reduction and Training will be responsible for training and the documentation of training.

The MCFRS will ensure that the written ICP is available to employees and to representatives of the US Occupational Safety and Health Administration (OSHA), the Maryland Occupational Safety and Health Administration (MOSH) and the National Institute of Occupational Safety and Health (NIOSH).

Contact location/phone number: MCFRS/Risk Mgmt. at (240) 777-8920.

Bloodborne Pathogens Standard Employer Requirements	
1910.1030(c)(1)(iv)(A):	The employer's sharps and engineering controls must reflect changes in technology that eliminate or reduce exposure to Bloodborne Pathogens.
1910.1030(c)(1)(iv)(B):	The employer shall document annual consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.
1910.1030(c)(1)(v):	An employer shall solicit input from non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps in the identification evaluation and selection of effective engineering and work practice controls.
Methods to Document Non-Managerial Employee Solicitation:	Joint labor and management safety committees, Informal problem-solving groups, Safety meetings and audits, Employee surveys, Worksite inspections, Suggestion box, or other means to obtain written employee comments, Pilot testing of devices, or use of bargaining agent.
Other Employer Requirements:	<ol style="list-style-type: none"> 1. The employees selected must represent the range of exposure situations encountered in the workplace. 2. The employer must document the process used and identify the employees or the positions involved in the exposure control plan.

EMPLOYEE EXPOSURE DETERMINATION:

The following is a list of **all** job classifications in our service in which all employees have occupational exposure:

JOB TITLE	DEPARTMENT/LOCATION
Firefighter/Rescuer I or EMS Provider I	MCFRS
Firefighter/Rescuer II or EMS Provider II	MCFRS
Firefighter/Rescuer III or EMS Provider III	MCFRS
Master Firefighter/ Rescuer or EMS Master Provider	MCFRS
Lieutenant or EMS Lieutenant	MCFRS
Captain or EMS Captain	MCFRS
Battalion Chief or Certified EMS Chief	MCFRS
Assistant Chief & Deputy Chief	MCFRS
Division Chief	MCFRS
Fire Chief	MCFRS

The following is a list of job classifications in which **some** employees at our establishment have occupational exposure. Included is a list of tasks and procedures, or groups of closely related tasks and procedures, in which occupational exposure may occur for these individuals:

JOB TITLE	DEPARTMENT/LOCATION	TASK/PROCEDURE
Example: Secretary	Health Clinic A – Admin. Aid	Secures Lab Specimens
Nurse Clinicians	PSTA	Administer injections; Start IV's
Inspectors	Fire Code Compliance	May provide first aid
SCBA Technicians	SCBA Shop	Decontaminate respiratory protection equipment
Mechanics	CMF	Exposure to contaminated equipment
Couriers	Logistics	Transport contaminated PPE

Part-time, temporary, contract, and per diem employees are covered by the standard.

METHODS OF IMPLEMENTATION AND CONTROL

UNIVERSAL PRECAUTIONS

All employees will utilize universal precautions. The term "universal precautions" refers to a concept of infectious disease control which requires that **all** human blood and OPIM be treated as if known to be infectious for HIV, HBV, HCV, or other bloodborne pathogens regardless of the perceived "low risk" status of a patient or patient population.

Alternative concepts in infection control are called Body Substance Isolation (BSI) and Standard Precautions. These methods define all body fluids and substances as infectious. These methods incorporate not only the fluids and materials covered by this standard but expand coverage to include all body fluids and substances.

These concepts are acceptable alternatives to universal precautions provided that facilities utilizing them adhere to all other provisions of the Bloodborne Pathogens standard.

INFECTION CONTROL PLAN (ICP)

Employees covered by the Bloodborne Pathogens standard will receive an explanation of this ICP during their initial training session. The plan will also be reviewed in the employee's annual refresher training. All employees will have an opportunity to review this plan at any time during the work shift by contacting: The Safety Chief or by going on-line to the FROMS website. If requested, MCFRS will provide an employee with a copy of the ICPICP free of charge and within 15 days of the request.

The MCFRS is responsible for reviewing and updating the ICP annually or more frequently, if necessary, to reflect **any new or modified tasks and procedures** that affect risks of occupational exposure and to reflect new or revised employee positions with risks of occupational exposure.

ENGINEERING AND WORK PRACTICE CONTROLS

Engineering and work practice controls will be used to prevent, or minimize, occupational exposure to bloodborne pathogens.

The Bloodborne Pathogens standard requires the employer to institute engineering controls or work practices controls as the primary means of eliminating or minimizing employee exposure (see paragraph 1910.1030(d)(2)(i)). **OSHA has always required employers to use engineering and work practice controls that eliminate occupational exposure or reduce it to the lowest feasible extent.** Preventing exposure requires a comprehensive program including the use of engineering controls which such as: needleless systems, shielded needle devices, and plastic capillary tubes.

Safer Sharps Evaluation Forms are located in Appendix B and examples of safer needle devices are contained in Appendix C "Reference Material."

Examples of "Work Practice Controls" include:

1. **Institution of a restrictive duty clause in employee policy.** An example of restrictive duty clause includes: Universal Precautions - Treatment of all human blood and certain body fluids as infectious for Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and other Bloodborne Pathogens.
2. **Prevention of the consumption of food or drink within clinical areas.** This will reduce the potential for contamination upon contact with contaminated surfaces, specimen containers, or activities with potential to expose personnel to blood, bodily fluids, or OPIM.
3. **Prohibition of needle recapping** unless an emergency alternative is required and then only with properly performed one-hand scoop (scoop-up cap of needle from a flat surface using a one-handed technique).

No one medical device is appropriate to use in all circumstances. Employers must implement the safer medical devices that are appropriate, commercially available, and effective. This is stated in the OSHA Instruction "Enforcement Procedures for the Occupational Exposure to Bloodborne Pathogens" (CPL 02-02-069 [formerly CPL 2-2.69] published on November 27, 2001).

The Bloodborne Pathogens standard requires examination of engineering controls for maintenance and/or replacement on a regular scheduled basis to ensure their effectiveness (see paragraph 1910.1030(d)(2)(ii)). **It is the employer's responsibility to regularly examine repair and/or replace engineering controls (as often as necessary).** This will ensure that each engineering control is maintained and provides the protection intended. Safer Sharps Evaluation forms are located in Appendix B "Safer Sharps Evaluation Forms."

The specific engineering controls and work practice controls used are listed below:

(For example: non-glass capillary tubes SESIPs needleless systems)

Annual Fit Test for respiratory protection, Needleless Access IV Drip Sets, Sharps Containers, Pre-filled Saline Flushes, Waterless Hand Cleaner and Antiseptic Towelettes, Universal Precautions, BD Safety Needles, Jelco Protective Plus-W Safety IV Catheter, Plastic Capillary Tubes, Eating and Drinking is prohibited
in work areas where there is a risk of an occupational exposure.

Sharps disposal containers are inspected and maintained or replaced by Montgomery County Fire and Rescue Service personnel and also by the vendor, Environmental Waste Services. All stations/facilities are on a set schedule for pick up. If you should need a special pick up, please contact the EMS Section Administrative Specialist at 240-777-2411.

This facility identifies the need for changes in engineering control and work practices through the following measures:

(Examples: Nurse Advisory Committee meetings for investigation and evaluation of safer engineered devices employee sharps survey OSHA record review employee interviews committee activities etc.)

The Station/Facilities Risk Consultation Program will be scheduled by the Station Commander/Site Coordinator with the Shift Safety Officer. The inspection and evaluation includes but is not limited to personnel, equipment, apparatus, and building facilities.

The following staff is involved in this process: **(Describe how employees will be involved)**

The MCFRS Training Academy staff members, Site Coordinator, and the employee's supervisor will oversee the annual training for all personal in bloodborne pathogens and airborne disease exposures.

The MCFRS Safety Section will ensure effective implementation of these recommendations and will collaborate with the Joint Health & Safety Committee and EMS Section on an annual basis to effectively implement state, federal, and local regulatory requirements.

FOR DEPARTMENTS UTILIZING SAFER SHARPS DEVICES

Has the department/division performed an annual **Needlestick Risk Assessment**?

Yes ☐

No ☐

Not Applicable ☐

We evaluated new procedures or new products by utilizing the following process. **(Describe the process)**

All new clinical equipment is evaluated by a joint labor/management EMS Equipment committee.

If not, please provide an explanation:

Please see Appendix B "Safer Sharps Evaluation Forms" for sample forms with evaluation criteria for selection of safer sharps devices and engineering controls.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE is provided to our employees at no cost to them. Training is provided by MCFRS in the use of the appropriate PPE for the tasks or procedures employees will perform.

The types of PPE available to employees are as follows:

(Examples - gloves eye protection etc.)

Simple Mask with face shield, disposable non-latex gloves, N95 Mask, Ear Loop Procedure Mask,

Personal Protection Infection Control Kit (gowns, head covering, shoe covers, and eye protection)

PPE is located in stations/facilities and may be obtained through the EMS Logistics process.
(Specify how employees are to obtain PPE and who is responsible for ensuring that it is available):

EMS PPE is located in all stations/facilities. PPE may be obtained through the EMS Logistics process.

All employees using PPE must observe the following precautions:

- Wash hands immediately, or as soon as feasible, after removal of gloves or other PPE. Handwashing signs that demonstrate proper handwashing techniques are located in Appendix C "Reference Material."
- Remove PPE after it becomes contaminated and before leaving the work area.
- Used PPE must be disposed of in red bio-hazard-labeled bags located throughout the facility.
- Wear appropriate gloves when it can be reasonably anticipated that there may be hand contact with blood or OPIM and when handling or touching contaminated items or surfaces; replace gloves if torn, punctured, or contaminated or if their ability to function as a barrier is compromised.
- Disposable gloves must be changed in-between patients. Never wash or decontaminate disposable gloves for reuse.
- Utility gloves may be decontaminated for reuse if their integrity is not compromised; discard utility gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eye, nose, or mouth.
- Remove immediately, or as soon as feasible, any garment contaminated by blood or OPIM in such a way as to avoid contact with the outer surface.

The procedure for handling used PPE is as follows: For example, how and where to decontaminate face shields eye protection or resuscitation equipment.

EMS PPE is disposable. Non disposable PPE equipment that has been contaminated with blood or OPIM shall be cleaned and disinfected as soon as possible. CDC recommends a 1:10 bleach solution.

(The employer may refer to specific agency procedure by title or number and last date of review)

The employer is responsible for providing PPE. If laboratory coats or uniforms are intended to protect the employee's body from contamination they are to be provided by the employer **at no cost to the employee.**

- **Uniforms/Scrubs:** If used as PPE, they must be laundered by the employer and not sent home with the employee for cleaning.
 - **Scrubs:** If worn in a manner similar to street clothing and would normally be covered by appropriate gowns, aprons, or lab coats when splashes to skin or clothes are reasonably anticipated, then they will be laundered by the employee.
 - **Resuscitator devices:** Are accessible to employees who can reasonably be expected to perform resuscitation procedures and emergency ventilation devices for use in resuscitation (e.g., masks mouthpieces resuscitation bags shields/overlay barriers).
-

- **Gloves:** "Hypoallergenic"* gloves, glove liners, powderless gloves, or other similar alternatives must be readily available and accessible at no cost to those employees who are allergic to the gloves normally provided.

* **NOTE:** The Federal Register Volume 62, No. 189, effective September 30, 1998 states that the FDA currently requires labeling statements for medical devices containing "natural rubber" and prohibits the use of the word "hypoallergenic" to describe such products.

- **Specimens** should be collected with gloved hands, placed in a bio-hazard labeled, leak-proof container, and enclosed in a sealed bag for transport with the request form in the outer sleeve pocket of the plastic bag to prevent contamination.
- **Protective eyewear:** "Goggles, glasses, or face shields" must be worn during procedures likely to cause splattering, splashing, or spraying of blood or body fluids. Eyewear should be shielded at the side, close fitting, and cleaned after each use (if not disposed).
- **N95 Respirator Mask-** a personal protective device that is worn on the face, covers at least the nose and mouth, and is used to reduce the wearer's risk of inhaling hazardous airborne particles.

For additional information on latex, see the following articles:

- NIOSH Alert Preventing Allergic Reactions to Natural Rubber Latex in the workplace (Publication No. 97-135) published in June 1997.
<http://www.cdc.gov/niosh/latexalt.html>
- Directorate of Technical Support Technical Information Bulletin: Potential for Allergy to Natural Rubber Latex Gloves and other Natural Rubber Products.
<http://www.osha.gov/dts/tib/tibdata/tib19990412.html>

HOUSEKEEPING

DISPOSAL OF REGULATED WASTE

Regulated waste is placed in containers which are closable, constructed to contain all contents and to prevent leakage, appropriately labeled bio-hazard or color-coded (**please see "Labels"**), and closed prior to removal to prevent spillage or protrusion of contents during handling. Brush and dustpan kits, along with an absorbent medium, are used for cleanup. No broken glassware is directly touched and only those trained on the Bloodborne Pathogens standard and Universal Precautions are permitted to clean up broken glassware.

HANDLING AND DISPOSAL OF BROKEN AND CONTAMINATED GLASSWARE OR OTHER BROKEN ITEMS

- **Broken glassware** (e.g., glass capillary tubes, lab specimen dishes, phlebotomy tubes) is capable of inflicting percutaneous injury and direct inoculation of bloodborne pathogens into the bloodstream.
- The Bloodborne Pathogens standard requires that broken glassware, or broken items, must be picked up using mechanical means, e.g., **brush and dust pan forceps, etc.**, (see paragraph 1910.1030(d)(4)(ii)(D)). These items also require decontamination or disposal after usage.

The procedure for handling and disposal of contaminated sharps and glassware is:
Contaminated sharps will be placed in appropriate labeled sharps containers. Activate the safety feature on the device and discard in the container. Do not bend, break, or recap needles.

HANDLING AND DISPOSAL OF SHARPS CONTAINERS

- Contaminated sharps are discarded immediately, or as soon as possible, in containers that are closable, puncture-resistant, leak proof on sides and bottoms, and labeled or color-coded appropriately.
- Sharps disposal containers are available at the following locations: Sharps Containers are located in all areas where sharps devices are used.
(NOTE: They **must** be easily accessible and as close as feasible to the immediate area where sharps are used).
- The Bloodborne Pathogens standard requires that sharps containers must be replaced routinely to prevent overfilling. Overfilling is associated with selection of containers that are too small to accommodate the volume of sharps, limited ability to (visually) see the contents and to determine the remaining capacity, and lax procedures for container maintenance (see paragraph 1910.1030(d)(4)(iii)(A)(2)(iii)).

For example, sharps containers can be examined to determine requirements for replacement by selecting containers with transparent windows and installation of containers at a height for routine visibility.

- The Bloodborne Pathogens standard also requires that if a sharps container can not be sealed to prevent leakage it must be placed in a secondary container (see paragraph 1910.1030(d)(4)(iii)(A)(2)(iii)).

The procedure for handling and disposal of sharps containers is:

To prevent the risk of needle sticks or cuts, sharps containers will only be filled $\frac{3}{4}$ of the way.

All stations/facilities are on a set schedule for pickups. If you should need a special pick up, please contact the EMS Section Administrative Specialist at (240-777-2411).

HANDLING AND DISPOSAL OF OTHER REGULATED WASTE

- The Bloodborne Pathogens standard requires both the inspection and decontamination **on a regularly scheduled basis** of cans bins pails and so forth which are intended for reuse (see paragraph 1910.1030(d)(4)(iii)(A)(2)(ii)).
 - The Bloodborne Pathogens standard also requires that regulated waste containers be closable; simply being closed does not ensure that waste will be contained (see paragraph 1910.1030(d)(4)(iii)(B)). Waste-containing bags may break and spill their contents including liquid blood.
-

For example, medical offices generating only a small volume of regulated waste may place that waste in a large holding container until the container is filled. In such a case, the container must be either color coded or labeled with a bio-hazard symbol. Also, the container must be leak-proof, puncture resistant, closeable, and designed to retain waste until pickup by a licensed contractor.

The procedure for handling and disposal of other regulated waste is:

Our current vendor is Environmental Waste Service, Inc. of Rockville. All stations/facilities are on a set schedule for pickups. If you should need a special pick up, please contact the EMS Section Administrative Specialist at (240-777-2411).

HANDLING OF CONTAMINATED WASTE PRIOR TO DISINFECTION OR STERILIZATION

- The Bloodborne Pathogens standard also affirms that proper decontamination of reusable equipment such as glassware or hand instruments can not be achieved in the presence of organic debris (e.g., blood) because it interferes with the efficacy of the disinfecting or sterilizing process (see paragraph 1910.1030(d)(4)(ii)).

The procedure for informing housekeeping (employees or contractors, etc.) performing required duties (in clinical lab areas, etc.) to maintain a safe distance from sharps, bio-hazard waste containers, and other areas of known or potential exposure to Bloodborne Pathogens is:

See DFRS Policy #814 Employee Right to Know Hazard Communication Program. Warning labels shall be affixed to containers of bio hazard waste, or OPIM.

CLEANING SCHEDULE AND METHODS

- The Bloodborne Pathogens standard allows for the cleaning schedules and methods to vary (see paragraph 1910.1030(d)(4)(i)). While extraordinary attempts to disinfect or sterilize environmental surfaces such as walls or floors are rarely indicated, routine cleaning and removal of soil is required. A "Cleaning and Decontamination Schedule" form is located in Appendix D.

The employer must determine and implement "**an appropriate written schedule of cleaning and decontamination**" based upon the location within the facility (e.g., interior cab of ambulance versus dental clinic), type of surface to be cleaned (e.g., hard-surfaced flooring versus carpeting), type of soil present (e.g., gross contamination versus minor splattering), and tasks and procedures being performed (e.g., laboratory analyses versus routine patient care).

The particular disinfectant used, as well as the frequency with which it is used, will depend upon the circumstances in which the housekeeping task occurs.

- The Bloodborne Pathogens standard requires the cleaning of contaminated work surfaces **after completion of procedures** to ensure that employees are not unwittingly exposed to blood or OPIM remaining on a surface from previous procedures (see paragraph 1910.1030(d)(4)(ii)(A)). This paragraph also requires contaminated work surfaces to be cleaned with an "appropriate disinfectant."

NOTE: Appropriate disinfectants include: "a diluted bleach solution and EPA registered tuberculocides (List B), sterilants registered by EPA (List A), products registered against HIV/HBV (List D), or Sterilants/High Level Disinfectants cleared by FDA." Links to the current lists are located in Appendix C "Reference Material."

NOTE: Please complete the "Cleaning and Decontamination Schedule" provided specifically for use by your department or division as required by MOSH/OSHA in Appendix D "Cleaning and Decontamination Schedule."

LAUNDRY

The following contaminated articles will be laundered by this company:
(If N/A, please indicate below).

Company	Articles
Maryland Fire Equipment Corporation 12284 Wilkins Avenue Rockville, MD 20852 (301) 881-2713	NFPA 1971 Structural Firefighting PPE, pants, coat, boots, and helmet.
Maryland Fire Equipment Corporation 12284 Wilkins Avenue Rockville, MD 20852 (301) 881-2713	NFPA 1999 EMS PPE, pant, coat, boots, and helmet

The following laundering requirements must be met:

- Handle contaminated laundry as little as possible with minimal agitation
- Place wet contaminated laundry in leak-proof labeled or color-coded containers before transport. Use red bags or bags marked with biohazard symbol for this purpose.
- Wear the following PPE when handling and/or sorting contaminated laundry:
 - Gloves

Note:

The Bloodborne Pathogens standard states that it is the **employer's responsibility** not only to provide PPE, but to clean, maintain and/or dispose of it (see paragraph 1910.1030(d)(3)(iv)). **Home laundering by employees is not permitted.**

BBP contaminated station uniforms must be laundered in the station's designated washing machine for contaminated articles or disposed of following outlined procedures if it cannot be decontaminated.

CENTERS FOR DISEASE CONTROL (CDC)
HEALTH TOPICS – LAUNDRY
<http://www.cdc.gov/ncidod/dhqp/bplaundry.html>

Although soiled linen may harbor large numbers of pathogenic microorganisms, the risk of actual disease transmission from soiled linen is negligible. Rather than rigid rules and regulations, common-sense hygienic practice for processing and storage of linen are recommended.

Soiled linen should be handled as little as possible and with minimum agitation to prevent gross microbial contamination of the air and of persons handling the linen. All soiled linen should be bagged or placed in containers at the location where it was used and should not be sorted or rinsed in the location of use. Linen heavily contaminated with blood or other bodily fluids should be bagged and transported in a manner that will prevent leakage. Soiled linen is generally stored in the laundry before washing.

Gloves and other appropriate protective apparel should be worn by laundry personnel while sorting soiled laundry.

Commercial laundry facilities often use water temperatures of at least 160 degrees Fahrenheit and 50-150 ppm of chlorine bleach to remove significant quantities of microorganisms from grossly contaminated linen. Studies have shown that a satisfactory reduction of microbial contamination can be achieved at water temperatures lower than 160 degrees Fahrenheit if the laundry chemicals suitable for low-temperature washing are used at proper concentrations. In the home, normal washing and drying cycles including "hot" or "cold" cycles are adequate to ensure patient safety. Instructions of the manufacturer's of the machine and the detergent or wash additive should be followed closely.

Commercial dry cleaning of fabrics soiled with blood also renders these items free of the risk of pathogen transmission. Clean linen should be handled transported and stored by methods that will ensure its cleanliness.

LABELING

The following labeling methods are used in this facility:

Item	Bio-hazard Label		Red Container
Examples:			
1. Centrifuge staged in clinic with both bio-hazard label	X	or	
2. Labeled regulatory contaminated waste bag	X	or	X
Regulated waste container (e.g., contaminated sharps containers)	X	or	X
Re-usable contaminated sharps container (e.g., surgical instruments soaking in tray)			
Refrigerator/freezer holding blood or other potentially infectious material (OPIM)			
Containers used for storage transport or shipping of blood			
Blood/blood products for clinical use			
Individual specimen containers of blood or OPIM in facility			
Contaminated equipment needing service (e.g., dialysis equipment, suction apparatus)			
Specimens and regulated waste shipped from the primary facility to another facility for service or disposal			
Contaminated laundry or other (please specify) <i>* Items soiled in blood bodily fluids or OPIM are disposed of in a bio-hazard labeled red waste bag.</i>			

Mark method used within facility with an "X" (Bio-hazard or Red Container). See above.

The FROMS will ensure warning labels are affixed, or red bags are used, as required if regulated waste or contaminated equipment is brought into the facility. Employees are to notify the Wellness Battalion Chief if they discover regulated waste containers, refrigerators containing blood or OPIM, contaminated equipment etc., without proper labeling.

Note: "Food or drink" and/or related utensils will **not** be brought into, or consumed in, clinical or lab areas. In addition, food and drink will not be stored in refrigerators, freezers, or other cold storage units provided for storage of medicine, blood, bodily fluids, or other potentially infectious materials within clinical or lab areas.

HEPATITIS B VACCINATION

FROMS staff will provide information to employees on Hepatitis-Hepatitis B vaccinations addressing the safety, benefits, efficacy, and methods of administration of this vaccine. A *Hepatitis B Fact Sheet* is available in Appendix C "Reference Material" to provide additional information on the benefits of being vaccinated.

The Hepatitis B vaccination series is available **at no cost** to employees identified in the exposure determination section of this plan. Vaccination is encouraged unless: 1) documentation exists that the employee has previously received the series, 2) antibody testing reveals that the employee is immune, or 3) medical evaluation shows that vaccination is contraindicated.

If an employee chooses to decline the vaccination the employee must sign a declination form. Employees who decline may request and obtain the vaccination at a later date at no cost. Documentation of refusal of the vaccination is maintained within the medical records. The "Hepatitis B Vaccination Declination Form" is located in Appendix E.

Employees who have previously received the HBV vaccination should provide a copy of his or her vaccination record, or obtain a statement from the provider to the effect that the employee has been vaccinated for HBV and the inoculation dates. An authorization to release medical information directly to FROMS is provided in Appendix F. Montgomery County Public School students may request a copy of his/her immunization records from the school to provide to FROMS, or they may use the "Authorization to Release Medical Information" form in Appendix F to have the information transmitted directly to FROMS.

Following a Bloodborne Pathogens exposure at the workplace "post-exposure" vaccinations will be provided to employees by FROMS, located at 255 Rockville Pike, Suite 135, Rockville, MD 20852, Phone 240-777-5185

Employees may receive vaccinations from FROMS/Occupational Medical Services (OMS), 255 Rockville Pike, Suite 125, Rockville, MD 20850, or from a personal private physician of choice.

POST-EXPOSURE EVALUATION AND FOLLOW-UP

1. Immediately following a Bloodborne Pathogens "exposure incident," the exposed employee shall immediately seek medical treatment. Following the initial medical treatment the employee should notify his/her immediate supervisor and the EMS Duty Officer.
2. The immediate supervisor should refer to the MCFRS Bloodborne Pathogens Exposure Procedures Checklist as a guideline for exposure incident reporting protocol. This includes contacting the **Montgomery County Claims Reporting Service at 1-888-606-2562** to file the First Report of Injury.
3. The immediate supervisor will then instruct employees involved in the exposure incident to report to FROMS and/or the nearest Emergency Room.

4. If FROMS is not the Licensed Healthcare Provider of choice the supervisor will refer to the instructions in the Supervisor's Bloodborne Pathogens Guideline/Forms and follow the MCFRS Bloodborne Pathogens Exposure Procedures Checklist.
5. The supervisor must then complete a "First Report of Injury" documenting circumstances surrounding the exposure incident.
6. The MCFRS supervisor must submit a copy of the "First Report of Injury," a copy of the "Medical Evaluation of Work Status Form", and a copy of the OSHA Standard to the exposed employee. These forms are provided for the exposed employee to take with them to the Licensed Healthcare Provider of their choice for evaluation treatment counsel and follow-up.
7. The MCFRS Safety Section will complete the exposure investigation through RMAP .

The MCFRS Supervisor's Bloodborne Pathogens Exposure Section contains the following information:

- MCFRS Supervisor's Bloodborne Pathogens Exposure Checklist
- Medical Evaluation of Work Status Form
- Healthcare Professional's Evaluation Report (also known as the "Blood/Body Fluid Exposure" Report)
- Copy of the Bloodborne Pathogen standard – 29 CFR 1910.1030

If FROMS is the Licensed Healthcare Provider of choice during normal business hours please contact FROMS at (240) 777-5185. If the incident occurs after business hours, employees should obtain treatment at the nearest hospital emergency room.

ADMINISTRATION OF POST-EXPOSURE EVALUATION AND FOLLOW-UP WITH PRIVATE PROVIDER.

Employees who seek treatment with a private provider (not FROMS) should take the Medical Evaluation of Work Status form and the Healthcare Professional's Evaluation Report to be completed by the private provider. The completed forms must then be submitted to FROMS to be added to the employee's medical record.

Post Exposure Follow-up treatment will include, as appropriate, the CDC's recommendations available in these documents.

Standards Hepatitis B Care

1. MMWR November 22, 1991 (post-exposure)
2. MMWR December 26, 1997 immunization (pre-exposure)

Standards HIV Post-Exposure Care

1. MMWR May 15, 1998 public health service for the management of healthcare worker exposures to HIV and recommendations to post-exposure prophylaxis.

The "Healthcare Professional's Evaluation Report" will be limited to whether the employee requires the Hepatitis-Hepatitis B vaccine and whether the vaccine was administered. The written opinion is maintained as part of the medical record.

- Montgomery County Fire and Rescue Service Employees who have reasonably anticipated workplace exposure to blood or OPIM will receive annual BBP training and will follow Montgomery County Fire and Rescue Service Policy mandated for all bloodborne pathogens exposure incidents.
- Training at the Montgomery County Fire and Rescue Service Training Academy will reinforce the ability to distinguish between the signs and symptoms of Hepatitis-Hepatitis B and transmission.
- The Montgomery County Fire and Rescue Service Training Academy will train and inform employees of the circumstances and the conditions in which they may be protected against the Hepatitis-Hepatitis B virus and as a result (in the event of a bloodborne pathogens exposure incident) the affected employee can then inform his or her licensed health care provider so appropriate care is provided.
- Hepatitis B immunoglobulin (HBIG) given within a week after the "Exposure Incident" provides 70%-75% protection from HBV.

PROCEDURES FOR EVALUATING THE CIRCUMSTANCES SURROUNDING AN EXPOSURE INCIDENT

The employee's immediate on-duty supervisor, in conjunction with the affected employee, will provide a detailed written statement outlining the exposure to the MCFRS Safety Section to be included in the Risk Map Report that outlines the circumstances of the bloodborne pathogens and/or airborne pathogen exposure incident.

This report will aid in the determination of:

- Engineering controls in use at the time work practices followed.
- A description of the device being used.
- Protective equipment or clothing that was used at the time of the exposure incident (gloves, eye shields, etc.).
- Location of the incident (O.R., E.R., patient room etc.).
- Procedure being performed when the incident occurred.
- Employee's training.

If the report results indicate that revisions need to be made, Wellness Battalion Chief /FROMS will ensure that appropriate changes are made to this ICP. (Changes may include an evaluation of safer devices, adding employees to the exposure determination list, etc.)

The MCFRS Safety Section, in conjunction with the immediate supervisor, will review the first report of injury and aid in the evaluation of circumstances regarding the exposure, as required, ensuring effective protocol for future occurrences.

THE FOLLOWING PROCEDURES ARE MANDATED BY OSHA/MOSH

- The employer of the exposed employee and a licensed healthcare provider will document the source individual (unless the employer can establish that identification is infeasible or prohibited by state or local law).

- If possible, the licensed healthcare provider should obtain consent from the source individual. The healthcare provider collects the employee's blood and makes arrangements to have the source individual tested as soon as possible to determine HIV, HCV, and HBV infectivity; also, the licensed healthcare provider should document that the source individual's test results were conveyed to the employee.
- If the source individual is already known to be HIV, HCV, and/or HBV positive, new testing need not be performed.
- The licensed healthcare provider should assure that the exposed employee is provided with the source individual's test results and with information about applicable disclosure laws and regulations concerning the identity and infectious status of the source individual (e.g., laws protecting confidentiality).
- After obtaining consent, the licensed healthcare provider collects the exposed employee's blood as soon as feasible after exposure incident and test blood for HBV and HIV serological status.
- If the employee does not give consent for HIV serological testing during collection of blood for baseline testing, the licensed healthcare provider must arrange for an accredited lab to preserve the baseline blood sample for at least 90 days. If the exposed employee elects to have the baseline sample tested during this waiting period the healthcare provider must arrange to perform testing as soon as feasible.

AFTER-HOURS BLOODBORNE PATHOGENS EXPOSURE INCIDENT TREATMENT

Employees who are involved in an exposure incident after normal business hours should obtain treatment at their nearest Emergency Room, Urgent Care Center, or other provider of the employee's choice. In addition to treatment, the employee shall contact their EMS Duty Officer and Station Officer to ensure that MCFRS Policy and Procedures are being followed. Employees must follow up with FROMS the next business day. Employees are **strongly** encouraged to take the Medical Evaluation Work Form with them and return the completed form to FROMS for review and follow-up, if necessary.

EMPLOYEE TRAINING

All employees who have occupational exposure to Bloodborne Pathogens receive training conducted by MCFRS Training Academy staff with the assistance of the Safety Section on annual basis.

All employees who have occupational exposure to Bloodborne Pathogens receive training on the epidemiology, symptoms, and transmission of Bloodborne Pathogens diseases.

In addition, the training program covers at a minimum the following elements:

- A copy and explanation of the standard.
- An explanation of our ICP and how to obtain a copy.
- An explanation of methods to recognize tasks and other activities that may involve exposure to blood, airborne pathogens, and OPIM, including what constitutes an exposure incident.
- An explanation of the use and limitations of engineering controls, work practices, and PPE.
- An explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE.
- An explanation of the basis for PPE selection.

- Information on the Hepatitis-Hepatitis B vaccine including information on it's efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine will be offered free of charge.
- Information on the appropriate actions to take and persons to contact in an emergency involving a Bloodborne pathogen, an airborne pathogen, or OPIM.
- An explanation of the procedure to follow if an exposure incident occurs including the method of reporting the incident and the medical follow-up that will be made available.
- Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident.
- An explanation of the signs, labels, and/or color coding required by the standard and used at different facilities.

RECORDKEEPING

TRAINING RECORDS

Training records are completed for each employee upon completion of training. These documents will be kept for at least three years on: PCAP for Career personnel and PIMS for volunteer personnel

The training records include:

- the dates of the training sessions,
- the contents or a summary of the training sessions,
- the names and qualifications of persons conducting the training, and
- the names and job titles of all persons attending the training sessions.

Employee training records are provided upon request to the employee, or the employee's authorized representative. Such requests should be addressed to: PSTA, 9710 Great Seneca Highway, Rockville, MD 20850.

MEDICAL RECORDS

Medical records are maintained for each employee with occupational exposure in accordance with "Access to Employee Exposure and Medical Records" codified at 29 CFR 1910.1020.

FROMS is responsible for the maintenance of the required medical records. These confidential records are kept at OMS for at least the duration of employment plus 30 years.

In order to maintain a complete Employee Medical Record, employees who seek treatment with a private provider (**not** OMS or Medical Access) should request a copy of the medical record and submit it to FROMS for retention.

Employee medical records are provided upon request of the employee, or to anyone having written consent of the employee, within 15 working days. Such requests should be sent to OMS. An appointment will be scheduled for the employee, or employee representative, to review and copy the requested records.

OSHA RECORDKEEPING

An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904). This determination and the recording activities are done by the Division of Risk Management and/or designee. Please see Appendix G "Exposure Incident Investigation Report."

A revision to the Recordkeeping Regulation (29 CFR Part 1904) was published January 19, 2001 and became effective January 1, 2002. The standard at paragraph 1904.8 requires all work-related injuries from needlesticks and cuts, lacerations, punctures, and scratches from sharp objects contaminated with another person's blood or OPIM to be recorded on the OSHA 300 Log as an injury. Paragraphs 1904.29(b)(6) thru (b)(9) discuss privacy concerns.

Employers must keep a separate confidential list of the case numbers and employee names so they can update the cases or provide them if asked by the government. If the employee develops a bloodborne disease the entry must be updated and recorded as an illness.

SHARPS INJURY LOG

The Bloodborne Pathogens standard requires employers to establish and maintain a *Sharps Injury Log* for the recording of percutaneous injuries from contaminated sharps. This log is separate from the *Log of Injuries and Illnesses* kept under Part 1904. The Sharps Injury Log must include the type and brand of device involved with the incident.

The Sharps Injury Log also requires identifying the department or work area where the "exposure incident" occurred and an explanation as to how the "exposure incident" resulted. This will help identify the intended evaluation of risk and the device's effectiveness.

More information may be included; however, the confidentiality of the employee must be maintained throughout the process. The purpose of the Sharps Injury log is to aid in the evaluation of devices being used in the workplace and to quickly identify problem areas in the facility. The log should be reviewed regularly and during the review and update of the ICP.

NOTE: If the data is made available to other parties (e.g., supervisor's safety committees, employees, and employee-representatives) any information that directly identifies an employee, or any information that could reasonably be used to identify the employee, must be withheld. Sharps Injury Logs must be saved for at least five years following the end of the calendar year that they cover. The format of the sharps injury log is not specified.

Please see Appendix B "Safer Sharps and Engineering Controls Review and Evaluation Forms" for the mandatory forms and Appendix H for a "Sharps Injury Log." Please complete review and utilize as required within your department or division.

APPENDIX A

Bloodborne Pathogens Information & Training

Objectives

- To understand what bloodborne pathogens are.
- How to reduce your risk as well as reduce the risk of others to an exposure.
- To comply with OSHA MOSHA and Montgomery County standards for bloodborne pathogens training.

Overview

Bloodborne pathogens (BBP) are bacteria, viruses, and other germs that are carried in the bloodstream. In 1992, OSHA announced a workplace standard entitled "Occupational Exposure To Bloodborne Pathogens." The purpose of implementing this standard was to remove or diminish exposure to pathogens for anyone who may face risk from exposure to blood and other potentially infectious material. Anyone who is expected to provide first aid or CPR in the course of the job, even if this is a rare or occasional occurrence, is required by OSHA, MOSH, and County policy to have bloodborne pathogens training **annually**.

Bloodborne pathogens that cause the biggest threat are:

- Hepatitis B Virus (HBV)
- Hepatitis C Virus (HCV)
- Human Immunodeficiency Virus (HIV)

Hepatitis B Virus (HBV)

Hepatitis is an inflammation of the liver. HBV spreads by contact with blood or an infected person or by having sex with an infected person. Hepatitis B affects more Americans than Hepatitis C or HIV.

1. You cannot receive HBV by:

- Coughing
- Kissing
- Sharing utensils
- Food or water
- Informal contact

2. HBV symptoms include:

- Joint pain
- Stomach aches
- Yellow skin or eyes
- Tiredness

3. A blood test can tell you if you have HBV.

4. Ways to protect yourself from getting infected with HBV:

- Get vaccinated
- Do not have sexual contact
- Do not share anything that might have blood on it

Hepatitis C Virus (HCV)

Hepatitis C is a liver disease caused by the Hepatitis C virus (HCV). Hepatitis C virus enters the body through direct blood exposure. Common examples of transmission events include receiving a blood transfusion from an infected source or sharing intravenous drug needles with an infected individual.

Because there is **no treatment or vaccine for HCV**, preventing exposures through dedicated use of universal precautions is the most effective way to reduce transmission of HCV in the workplace.

Hepatitis C Virus (HCV) is **not** spread by:

- Coughing
- Kissing
- Sharing utensils
- Food or water
- Informal contact

Human Immunodeficiency Virus (HIV)

HIV (human immunodeficiency virus) is the virus that causes AIDS. This virus may be passed from one person to another when infected blood semen or vaginal secretions come in contact with an uninfected person's broken skin or mucous membranes.

1. HIV Is Spread by:
 - Infected blood or bodily fluids into an open cut
 - Contaminated needles
 - Tattoos or piercing from contamination needles
 - Sexual contact
 - Transfusions (rarely happens)
2. You **cannot** get HIV from:
 - Toilet seats
 - Touching an infected person
 - Mosquito, tick bite, or flea bites
 - Being sneezed or coughed on by an infected person

Means of Transmission

HIV and HBV bloodborne pathogens may be transmitted from the infected individual to other individuals by blood or other infectious sources such as:

- Body fluids
- Any detached body tissue or organ from a human

HIV and HBV are transmitted through:

- Sexual contact
- Sharing needles
- Puncture wounds
- Contact between broken skin and the infected body fluids
- From mothers to their children

HCV is transmitted through direct blood exposure:

- Blood transfusion from an infected source
- Sharing intravenous drug needles with an infected source

Standards

"*Universal Precautions*" is the name used to describe a prevention strategy in which all blood and potentially infectious materials are treated as if they are infectious regardless of the perceived status of the source individual. On every EMS call, the EMS provider should conduct an initial and ongoing evaluation of the risk for a possible exposure to an infectious disease. The initial and ongoing evaluation will determine the type of PPE measures the provider will take.

By using Universal Precautions and following these simple engineering and work practice controls you can protect yourself and prevent transmission of bloodborne pathogens.

- Treat all human blood and body fluids as if they are known to be infectious for HIV, HBV, HCV and other bloodborne pathogens.
- Protect yourself; it is crucial to have a barrier between you and the potential infectious material. All cuts and sores should be covered with a bandage before applying pressure with disposable gloves.
- Always wear personal protective gear in exposure circumstances.
- Use a freshly made solution of ¼ cup bleach to 1 gallon of water (1:10), to clean a blood or body fluid spill area.
- Use disposable towels. Everything must be placed in a biohazard container and disposed of properly.
- Remove or replace any personal protective gear that is torn or punctured.
- Remove personal protective gear before leaving your work area.
- Handle and dispose of any sharp items that may be contaminated with extreme caution. Never use bare hands.
- Wash hand immediately or as soon as possible after removal of glove or other personal protective gear. Hand sanitizers may be used if immediate hand washing isn't possible.

Personal Protective Equipment (should be readily accessible)

Gloves – Gloves should be single-use and made of latex or nitrile and worn during patient contact (i.e. body/bloody fluids, mucous membranes, non-intact skin, or other potentially infectious disease)

- Gloves
- Protective eyewear
- Face shields
- Aprons
- Patient mask
- Caps and booties
- N95 Respirator Mask
- CPR mask
- Caps and booties
- Disposable head Cover
- Disposable shoe cover
- Disposable Isolation Gowns
- Surgical Mask

Decontamination- All equipment and work surfaces must be cleaned and decontaminated with an appropriate EPA approved disinfectant after contact with blood, body fluids, or other potentially infectious material. Providers must insure adequate cleaning of the equipment and vehicle after every patient transport. The cleaning should include disinfecting any reusable equipment used on the patient (B/P cuff, stethoscope, monitor, stretcher, etc.), soiled surfaces, and frequently touched surfaces.

The first step in the cleaning process is removing gross contamination, debris, and soil with a towel or germicidal disinfectant wipes and properly disposing of the cleaning wipes in a red biohazard bag. After a surface has been cleaned it can be decontaminated. Germicidal disinfectant wipes such as Sani-Cloth Plus are easy and efficient to use on reusable equipment. One minute contact is all that is needed on most surfaces. One of the most effective disinfectants is a simple bleach and water solution. A ratio of 1:10 is the preferred mixture. The mixture works out to be a quarter cup of bleach for every gallon of water. The shelf life for this solution is one day so it needs to be labeled properly.

Airborne Pathogens Information & Training

Objectives

- **To understand what airborne diseases are.**
- **How to reduce your risk as well as reduce the risk of others to an exposure**

Airborne disease- An **airborne disease** is any disease that is caused by pathogens and transmitted through the air. In 1992, OSHA announced a workplace standard entitled "Occupational Exposure to Bloodborne Pathogens." The purpose of implementing this standard was to remove or diminish exposure to pathogens for anyone who may face risk from exposure to blood and other potentially infectious material. Anyone who is expected to provide first aid or CPR in the course of the job, even if this is a rare or occasional occurrence, is required by OSHA, MOSH, and County policy to have bloodborne pathogens training **annually**.

Airborne diseases that cause the biggest threat are:

- Influenza (Flu)
- Meningitis (Bacterial / Viral)
- Chickenpox
- Tuberculosis (TB)

Influenza (Flu)

Influenza, commonly known as the "flu," is an extremely contagious respiratory illness caused by influenza A or B viruses. Flu appears most frequently in winter and early spring. The flu virus attacks the body by spreading through the upper and/or lower respiratory tract.

Means of Transmission

The flu virus is spread from person to person through respiratory secretions and typically sweeps through large groups of people who spend time in close contact, such as daycare facilities, classrooms, college dormitories, military barracks, offices, and nursing homes.

Flu is spread when you inhale droplets in the air that contain the flu virus, make direct contact with respiratory secretions through sharing drinks or utensils, or handle items contaminated by an infected person. In the latter case, the flu virus on your skin can infect you when you touch or rub your eyes, nose, or mouth. That's why frequent and thorough handwashing is a key way to limit the spread of influenza. Flu symptoms start to develop from one to four days after infection with the virus.

Meningitis

Bacterial Meningitis

Meningitis is a relatively rare infection that affects the delicate membranes -- called meninges that cover the brain and spinal cord.

Means of Transmission

The germs that cause bacterial meningitis can be contagious. Some bacteria can spread through the exchange (e.g., by kissing) of respiratory and throat secretions (e.g., saliva or mucus). **Fortunately, most of the bacteria that cause meningitis are not as contagious as viruses that cause the common cold or the flu.** Also, the bacteria are not spread by casual contact or by simply breathing the air where a person with meningitis has been

Viral Meningitis

Another form of meningitis that is often less severe than bacterial meningitis and usually resolves without specific treatment.

Means of Transmission

Enteroviruses, the most common cause of viral meningitis, are most often spread from person to person through fecal contamination (which can occur when changing a diaper or using the toilet and not properly washing hands afterwards). Enteroviruses can also be spread through respiratory secretions (saliva, sputum, or nasal mucus) of an infected person. Other viruses, such as mumps and varicella-zoster virus, may also be spread through direct or indirect contact with saliva, sputum, or mucus of an infected person. Contact with an infected person may increase your chance of becoming infected with the virus that made them sick; however, you are not likely to develop meningitis as a complication of the illness.

Chickenpox (VZV)

Chickenpox (varicella) is a viral infection that causes an itchy, blister-like rash. Chickenpox is highly contagious to people who haven't had the disease nor been vaccinated against it.

Means of Transmission

It spreads easily from infected people to others who have never had chickenpox or received the chickenpox vaccine. Chickenpox spreads in the air through coughing or sneezing. It can also be spread by touching or breathing in the virus particles that come from chickenpox blisters.

Signs & Symptoms

The classic symptom of chickenpox is a rash that turns into itchy, fluid-filled blisters that eventually turn into scabs. The rash may first show up on the face, chest, and back then spread to the rest of the body, including inside the mouth, eyelids, or genital area. It usually takes about one week for all the blisters to become scabs.

Other typical symptoms that may begin to appear 1-2 days before rash include:

- high fever
- tiredness
- loss of appetite
- headache

Tuberculosis (TB)

Tuberculosis (TB) is a multi-systemic infectious disease caused by *Mycobacterium tuberculosis*, a rod-shaped bacterium.

Means of Transmission

TB is spread through the air from one person to another. The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. People nearby may breathe in these bacteria and become infected.

Signs and Symptoms of TB Disease

Symptoms of TB disease depend on where in the body the TB bacteria are growing. TB bacteria usually grow in the lungs (pulmonary TB). TB disease in the lungs may cause symptoms such as:

- a bad cough that lasts 3 weeks or longer
- pain in the chest
- coughing up blood or sputum (phlegm from deep inside the lungs)
- Other symptoms of TB disease are
- weakness or fatigue
- weight loss
- no appetite
- chills
- fever
- sweating at night

Infection Control Standards and Practices

"*Universal Precautions*" is the name used to describe a prevention strategy in which all blood, airborne, and potentially infectious materials are treated as if they are infectious regardless of the perceived status of the source individual. On every EMS call, the EMS provider should conduct an initial and ongoing evaluation of the risk for a possible exposure to an infectious disease. The initial and ongoing evaluation will determine the type of PPE measures the provider will take.

By using Universal Precautions and following these simple engineering and work practice controls you can protect yourself and prevent transmission of bloodborne pathogens.

- Treat all human blood and body fluids as if they are known to be infectious for HIV, HBV, HCV and other bloodborne pathogens.
- Protect yourself; it is crucial to have a barrier between you and the potential infectious material. All cuts and sores should be covered with a bandage before applying pressure with disposable gloves.
- Always wear personal protective gear in exposure circumstances.
- Use a freshly made solution of ¼ cup bleach to 1 gallon of water (1:10), to clean a blood or body fluid spill area.
- Use disposable towels. Everything must be placed in a biohazard container and disposed of properly.
- Remove or replace any personal protective gear that is torn or punctured.
- Remove personal protective gear before leaving your work area.
- Handle and dispose of any sharp items that may be contaminated with extreme caution. Never use bare hands.

- Wash hand immediately or as soon as possible after removal of glove or other personal protective gear. Hand sanitizers may be used if immediate hand washing isn't possible.

Personal Protective Equipment (should be readily accessible)

- Gloves
- Protective eyewear
- Face shields
- Aprons
- Patient mask
- Caps and booties
- N95 Respirator Mask
- CPR mask
- Caps and booties
- Disposable head Cover
- Disposable shoe cover
- Disposable Isolation Gowns
- Surgical Mask

The rule of thumb is the 3-foot rule. A provider will don a mask within three feet of the patient. Using this distance for donning mask has been effective in preventing droplet transmission of infectious diseases. All contaminated gear and materials must be handled with extreme caution and placed in an appropriate labeled container until it is decontaminated or properly disposed of.

A surgical mask should be used to protect the mouth and nose from splashes of blood/body fluids or respiratory secretions. They can also be placed on patients who are coughing/sneezing to reduce the spread of a disease (ex. TB, Measles, Pneumonia, Influenza, etc.). If a patient is unable to wear a mask, provide tissues and instructions on when to use them (coughing, sneezing, and controlling nasal secretions).

Decontamination- All equipment and work surfaces must be cleaned and decontaminated with an appropriate EPA approved disinfectant after contact with blood, body fluids, or other potentially infectious material. Providers must insure adequate cleaning of the equipment and vehicle after every patient transport. The cleaning should include disinfecting any reusable equipment used on the patient (B/P cuff, stethoscope, monitor, stretcher, etc.), soiled surfaces, and frequently touched surfaces.

The first step in the cleaning process is removing gross contamination, debris, and soil with a towel or germicidal disinfectant wipes and properly disposing of the cleaning wipes in a red biohazard bag. After a surface has been cleaned it can be decontaminated. Germicidal disinfectant wipes such as Sani-Cloth Plus are easy and efficient to use on reusable equipment. One minute contact is all that is needed on most surfaces. One of the most effective disinfectants is a simple bleach and water solution. A ratio of 1:10 is the preferred mixture. The mixture works out to be a quarter cup of bleach for every gallon of water. The shelf life for this solution is one day so it needs to be labeled properly.

Infection Control Practices

SIGNS/SYMPTOMS	POSSIBLE INFECTIOUS DISEASE	PRECAUTIONS
Chickenpox Rash, fever, draining lesions, photosensitivity	Herpes Zoster	Minimum BSI- Gloves Surgical mask on patient Providers Wear N95 Mask Avoid contact with drainage from lesions
Hemorrhagic Fever Marked Fever, fatigue, nausea, coughing, dizziness, vomiting, bleeding under the skin, internal organs, or body orifices.	Viral Hemorrhagic Fever	Minimum BSI-Full PPE. Head cover, gloves, gown, shoe covers, N95 Mask, Goggles. Surgical mask on patient. For suspected EVD patient please refer to the following link: http://mcemsops.blogspot.com/2014/10/mcfrs-evd-response-information.html
Influenza Fever, fatigue, nausea, vomiting, diarrhea, cough, chills, Sneezing	Influenza	Minimum BSI- Gloves Surgical mask on patient Providers wear N95 Mask Good airflow in the patient compartment of the EMS Unit.
Measles Rash, fever, headache,	Rubella	Minimum BSI- Gloves Surgical mask on patient Providers wear N95 Mask
Meningitis Intense headache, sensitive to light, vomiting, stiff neck, rash-pink	Neisseria Meningitidis	Minimum BSI- Gloves Surgical Mask on patient
Risk of Drug Resistant Microorganism History of infection or colonization with drug resistant organisms or skin, wound, or urinary tract infection in a patient with a recent hospital or nursing home stay in a facility where multi drug resistant organisms are prevalent	MRSA, VRE, or other drug resistant bacteria.	Minimum BSI- Gloves. A gown, face shield, and/or shoe covers can be used if the provider anticipates body contact with contaminated fluids, or bandages from infected wounds.
Tuberculosis Persistent cough for 3 weeks or more. Weight loss, fever, night sweats, coughing up blood, chest pain. High risk patients (foreign born, homeless, drug user).	Tuberculosis	Minimum BSI- Gloves Surgical mask on patient Providers wear N95 Mask

APPENDIX B

SAFER SHARPS AND ENGINEERING CONTROLS EVALUATION FORMS

GUIDELINES FOR THE USE OF SAFETY FEATURE EVALUATION SHEETS

Coordinators:

Determine which products are to be evaluated and provide at least four or more test samples for each individual evaluating the product. (Each evaluator should have enough samples to disassemble and examine the design thoroughly.)

Set up a testing station for each type of device which allows testers to evaluate products in a simulated patient procedure. Provide training dummies (injection pads, oranges, etc.) as necessary.

Provide visual instructions and demonstrate proper use of each device.

Review the instructions and rating system with each evaluator.

Encourage each evaluator to comment on the sheets and prioritize the questions at the end of the evaluation. This will provide a useful decision making tool and will help alert you to specific areas of concern which may not have been covered by the questionnaire.

Evaluators:

Re-enact all steps of intended or possible procedures performed with the device being tested.

Attempt to misuse the device and circumvent or disable the safety feature.

Answer each question including the short answer section at the end. If you do not understand a question, please write comments directly on the sheets.

NOTE: The utility of these criteria is for initial screening of devices and NOT for clinical assessment/pilot testing. Certain assumptions have been made in the development of these forms based on information about currently available products. We recognize the likelihood that the ideal product may not exist. Safety Section welcomes your comments on the use of these tools.

Source: *Reprinted with permission of Training for Development of Innovative Control Technology Project*

SAFETY FEATURE EVALUATION FORM
SAFETY SYRINGES

Date:		Department:		Occupation:	
Product:				Number of times used:	

Please circle the most appropriate answer for each question. Not applicable (N/A) may be used if the question does not apply to this particular product.

	Agree → Disagree
DURING USE:	
1. The safety feature can be activated using a one-handed technique.	1 2 3 4 5 N/A
2. The safety feature does not obstruct vision of the tip of the sharp.	1 2 3 4 5 N/A
3. Use of this product requires you to use the safety feature.	1 2 3 4 5 N/A
4. This product does not require more time to use than a non-safety device.	1 2 3 4 5 N/A
5. The safety feature works well with a wide variety of hand sizes.	1 2 3 4 5 N/A
6. The device is easy to handle while wearing gloves.	1 2 3 4 5 N/A
7. This device does not interfere with uses that do not require a needle.	1 2 3 4 5 N/A
8. This device offers a good view of any aspirated fluid.	1 2 3 4 5 N/A
9. This device will work with all required syringe and needle sizes.	1 2 3 4 5 N/A
10. This device provides a better alternative to traditional recapping.	1 2 3 4 5 N/A
AFTER USE:	
11. There is a clear and unmistakable change (audible or visible) that occurs when the safety feature is activated.	1 2 3 4 5 N/A
12. The safety feature operates reliably.	1 2 3 4 5 N/A
13. The exposed sharp is permanently blunted or covered after use and prior to disposal.	1 2 3 4 5 N/A
14. This device is no more difficult to process after use than non-safety devices.	1 2 3 4 5 N/A
TRAINING:	
15. The user does not need extensive training for correct operation.	1 2 3 4 5 N/A
16. The design of the device suggests proper use.	1 2 3 4 5 N/A
17. It is not easy to skip a crucial step in proper use of the device.	1 2 3 4 5 N/A
Of the above questions which three are the most important to your safety when using this product?	
Are there other questions which you feel should be asked regarding the safety/utility of this product?	

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SAFETY FEATURE EVALUATION FORM
I.V. ACCESS DEVICES

Date:		Department:		Occupation:	
Product:				Number of times used:	

Please circle the most appropriate answer for each question. Not applicable (N/A) may be used if the question does not apply to this particular product.

	Agree → Disagree
1. The safety feature can be activated using a one-handed technique.	1 2 3 4 5 N/A
2. The safety feature does not interfere with normal use of this product.	1 2 3 4 5 N/A
3. Use of this product requires you to use the safety feature.	1 2 3 4 5 N/A
4. This product does not require more time to use than a non-safety device.	1 2 3 4 5 N/A
5. The safety feature works well with a wide variety of hand sizes.	1 2 3 4 5 N/A
6. The device allows for rapid visualization of flashback in the catheter or chamber.	1 2 3 4 5 N/A
7. Use of this product does not increase the number of sticks to the patient.	1 2 3 4 5 N/A
8. The product stops the flow of blood after the needle is removed from the catheter (or after the butterfly is inserted) and just prior to line connections or hep-lock capping.	1 2 3 4 5 N/A
9. A clear and unmistakable change (either audible or visible) occurs when the safety feature is activated.	1 2 3 4 5 N/A
10. The safety feature operates reliably.	1 2 3 4 5 N/A
11. The exposed sharp is blunted or covered after use and prior to disposal.	1 2 3 4 5 N/A
12. The product does not need extensive training to be operated correctly.	1 2 3 4 5 N/A
Of the above questions which three are the most important to your safety when using this product?	
Are there other questions which you feel should be asked regarding the safety/utility of this product?	

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SAFETY FEATURE EVALUATION FORM
SHARPS DISPOSAL CONTAINERS

Date:		Department:		Occupation:	
Product:				Number of times used:	

Please circle the most appropriate answer for each question. Not applicable (N/A) may be used if the question does not apply to this particular product.

	Agree → Disagree
1. The container's shape, its markings, or its color imply danger.	1 2 3 4 5 N/A
2. The implied warning of danger can be seen from the angle at which people commonly view it (e.g., very short people, people in wheel chairs, children, etc).	1 2 3 4 5 N/A
3. The implied warning can be universally understood by visitors, children, and patients.	1 2 3 4 5 N/A
4. The container's purpose is self-explanatory and easily understood by a worker who may be pressed for time or unfamiliar with the hospital setting.	1 2 3 4 5 N/A
5. The container can accept sharps from any direction desired.	1 2 3 4 5 N/A
6. The container can accept all sizes and shapes of sharps.	1 2 3 4 5 N/A
7. The container allows single handed operation. (Only the hand holding the sharp should be near the container opening).	1 2 3 4 5 N/A
8. It is difficult to reach in and remove a sharp.	1 2 3 4 5 N/A
9. Sharps can go into the container without getting caught on the opening.	1 2 3 4 5 N/A
10. Sharps can go into the container without getting caught on any molded shapes in the interior.	1 2 3 4 5 N/A
11. The container is puncture resistant.	1 2 3 4 5 N/A
12. When the container is dropped or turned upside down (even before it is permanently closed) sharps stay inside.	1 2 3 4 5 N/A
13. The user can determine easily from various viewing angles when the container is full	1 2 3 4 5 N/A
14. When the container is to be used free-standing (no mounting bracket) it is stable and unlikely to tip over.	1 2 3 4 5 N/A
15. It is safe to close the container. (Sharps should not protrude into the path of hands attempting to close the container).	1 2 3 4 5 N/A
16. The container closes securely (e.g., if the closure requires glue it may not work if the surfaces are soiled or wet.).	1 2 3 4 5 N/A
17. The product has handles which allow you to safely transport a full container.	1 2 3 4 5 N/A
18. The product does not require extensive training to operate correctly.	1 2 3 4 5 N/A
Of the above questions which three are the most important to your safety when using this product?	
Are there other questions which you feel should be asked regarding the safety/utility of this product?	

Source: Reprinted with permission of Training for Development of Innovative Control Technology Project

SAFETY FEATURE EVALUATION FORM
I.V. CONNECTORS

Date:		Department:		Occupation:	
Product:				Number of times used:	

Please circle the most appropriate answer for each question. Not applicable (N/A) may be used if the question does not apply to this particular product.

	Agree → Disagree
1. Use of this connector eliminates the need for exposed needles in connections.	1 2 3 4 5 N/A
2. The safety feature does not interfere with normal use of this product.	1 2 3 4 5 N/A
3. Use of this product requires you to use the safety feature.	1 2 3 4 5 N/A
4. This product does not require more time to use than a non-safety device.	1 2 3 4 5 N/A
5. The safety feature works well with a wide variety of hand sizes.	1 2 3 4 5 N/A
6. The safety feature allows you to collect blood directly into a vacuum tube eliminating the need for needles.	1 2 3 4 5 N/A
7. The connector can be secured (locked) to Y-sites hep-locks and central lines.	1 2 3 4 5 N/A
8. A clear and unmistakable change (either audible or visible) occurs when the safety feature is activated.	1 2 3 4 5 N/A
9. The safety feature operates reliably.	1 2 3 4 5 N/A
10. The exposed sharp is blunted or covered after use and prior to disposal.	1 2 3 4 5 N/A
11. The product does not need extensive training to be operated correctly.	1 2 3 4 5 N/A
Of the above questions which three are the most important to your safety when using this product?	
Are there other questions which you feel should be asked regarding the safety/utility of this product?	

Source: *Reprinted with permission of Training for Development of Innovative Control Technology Project*

SAFETY FEATURE EVALUATION FORM
VACUUM TUBE BLOOD COLLECTION SYSTEMS

Date:		Department:		Occupation:	
Product:				Number of times used:	

Please circle the most appropriate answer for each question. Not applicable (N/A) may be used if the question does not apply to this particular product.

	Agree → Disagree
1. The safety feature can be activated using a one-handed technique.	1 2 3 4 5 N/A
2. The safety feature does not interfere with normal use of this product.	1 2 3 4 5 N/A
3. Use of this product requires you to use the safety feature.	1 2 3 4 5 N/A
4. This product does not require more time to use than a non-safety device.	1 2 3 4 5 N/A
5. The safety feature works well with a wide variety of hand sizes.	1 2 3 4 5 N/A
6. The safety feature works with a butterfly.	1 2 3 4 5 N/A
7. A clear and unmistakable change (either audible or visible) occurs when the safety feature is activated.	1 2 3 4 5 N/A
8. The safety feature operates reliably.	1 2 3 4 5 N/A
9. The exposed sharp is blunted or covered after use and prior to disposal.	1 2 3 4 5 N/A
10. The inner vacuum tube needle (rubber sleeved needle) does not present a danger of exposure.	1 2 3 4 5 N/A
11. The product does not need extensive training to be operated correctly.	1 2 3 4 5 N/A
Of the above questions which three are the most important to your safety when using this product?	
Are there other questions which you feel should be asked regarding the safety/utility of this product?	

Source: Reprinted with permission of Training for Development of Innovative Control Technology Project

APPENDIX C
REFERENCE MATERIAL

HEPATITIS C STANDARDS

MMWR RECOMMENDATIONS and REPORTS OCTOBER 16, 1998
RECOMMENDATIONS FOR PREVENTION AND CONTROL OF HEPATITIS C VIRUS
(HCV) INFECTION AND CHRONIC DISEASE

STANDARDS FOR HEPATITIS B CARE

1. MMWR NOVEMBER 22, 1991 (POST-EXPOSURE)
2. MMWR DECEMBER 26, 1997 IMMUNIZATION (PRE-EXPOSURE)

STANDARDS FOR HIV POST EXPOSURE CARE

MMWR MAY 15, 1998 PUBLIC HEALTH SERVICE FOR THE MANAGEMENT OF
HEALTH –CARE WORKER EXPOSURES TO HIV AND RECOMMENDATIONS TO
POST-EXPOSURE PROPHYLAXIS

GUIDELINE FOR HAND HYGIENE IN HEALTHCARE SETTINGS.

MMWR 51 (RR16); OCTOBER 25, 2002
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>

APPROPRIATE DISINFECTANT LISTS

EPA Listing Of Appropriate Disinfectants - Sterilants Registered By EPA (List-A) EPA
Registered Tuberculocides (List-B) Products Registered Against HIV/HBV (List-D)
<http://nain.orst.edu/> or at (800) 447-6349

Sterilants/High Level Disinfectants Cleared By FDA
<http://www.fda.gov/cdrh/ode/germlab.html>

GUIDELINES FOR HANDWASHING AND REMOVAL OF GLOVES

Excerpted from The Centers for Disease Control (CDC) Hand Hygiene Guidelines
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>

USE OF ALCOHOL BASED HAND RUBS

Hand washing, or use of alcohol-based hand rubs, has been shown to terminate outbreaks in health care facilities to reduce transmission of antimicrobial resistant organisms (e.g., methicillin resistant staphylococcus aureus, MRSA), and reduce overall infection rates.

When using an alcohol-based hand rub, apply product to palm of one hand and rub hands together covering all surfaces of hands and fingers until hands are dry. Note that the volume needed to reduce the number of bacteria on hands varies by product. Alcohol-based hand rubs significantly reduce the number of microorganisms on skin are fast acting and cause less skin irritation.

When evaluating hand hygiene products for potential use in health care facilities, administrators or product selection committees should consider the relative efficacy of antiseptic agents against various pathogens and the acceptability of hand hygiene products by personnel. Characteristics of a product that can affect acceptance, and therefore its usage, include its smell, consistency, color, and the effect of dryness on hands.

Allergic contact dermatitis due to alcohol hand rubs is very uncommon. However, with increasing use of such products by health care and other personnel, it is likely that true allergic reactions to such products will occasionally be encountered.

Alcohol-based hand rubs take less time to use than traditional hand washing. In an eight-hour shift an estimated one hour of an ICU nurse's time will be saved by using an alcohol-based hand-rub.

CDC is releasing guidelines to improve adherence to hand hygiene in health care settings. In addition to traditional hand washing with soap and water, CDC is recommending the use of alcohol-based hand-rubs by health care personnel for patient care because they address some of the obstacles that health care professionals face when taking care of patients.

USE OF SOAP AND WATER FOR HAND WASHING

Hand washing with soap and water remains a sensible strategy for hand hygiene in non-health care settings and is recommended by CDC and other experts. When health care or other affected personnel's hands are visibly soiled they should wash with soap and water.

The recommended hand washing technique depends on the purpose of the hand washing. The ideal duration of hand washing is not known, but washing times of 15 seconds or less have been reported as effective in removing most transient contaminants from the skin. Therefore, for most activities, a vigorous and brief (at least 10 seconds) rubbing together of all surfaces of lathered hands followed by rinsing under a stream of water is recommended. If hands are visibly soiled, more time may be required for hand washing.

The absolute indications for hand washing with plain soaps and detergents versus hand washing with antimicrobial-containing products are not known because of the lack of well-controlled studies comparing infection rates when such products are used. For most routine activities, hand washing with

plain soap appears to be sufficient since soap will allow most transient microorganisms to be washed off. As part of these recommendations, CDC is asking health care facilities to develop and implement a system for measuring improvements in adherence to these hand hygiene recommendations.

These include: periodic monitoring of hand hygiene, adherence, and providing feedback to personnel regarding their performance, monitoring the volume of alcohol-based hand-rub used/1000 patient days, monitoring adherence to policies dealing with wearing artificial nails, and focused assessment of the adequacy of health care personnel hand hygiene when outbreaks of infection occur.

THE USE AND REMOVAL OF GLOVES

The use of gloves does not eliminate the need for hand hygiene. Likewise, the use of hand hygiene does not eliminate the need for gloves. Gloves reduce hand contamination by 70 percent to 80 percent, prevent cross-contamination, and protect patients and health care personnel from infection. Hand-rubs should be used before and after each patient just as gloves should be changed before and after contact with affected persons.

The convenient placement of sinks, hand washing products, and paper towels is often suggested as a means of encouraging frequent and appropriate hand washing. Sinks with faucets that can be turned off by means other than the hands (e.g., foot pedals) and sinks that minimize splash can help personnel avoid immediate recontamination of washed hands.

Although hand washing is considered the most important single procedure for preventing nosocomial infections, two reports showed poor compliance with hand washing protocols by personnel in medical intensive care units, especially by physicians and personnel taking care of patients on isolation precautions. Failure to wash hands is a complex problem that may be caused by lack of motivation or lack of knowledge about the importance of hand washing.

It may also be caused by obstacles such as understaffing, inconveniently located sinks, absence of paper towels, an unacceptable hand washing product, or the presence of dermatitis caused by previous hand washing. More study is needed to identify which of these factors alone or in combination contribute significantly to the problem of poor compliance with hand washing recommendations.

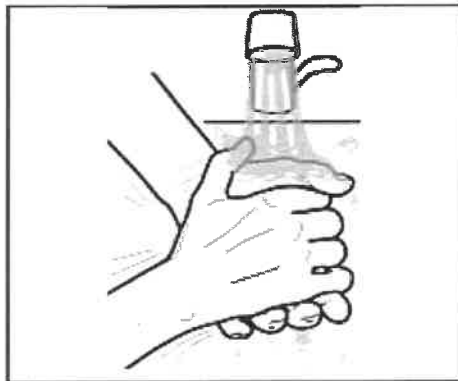
NOTE: Health care personnel should avoid wearing artificial nails and keep natural nails less than one quarter of an inch long if they care for patients at high risk of acquiring infections (e.g., Patients in intensive care units or in transplant units).

FOR ADDITIONAL INFORMATION ON HAND WASHING AND HYGIENE PLEASE REVIEW THE OCT. 25, 2002 (CDC) MMWR 51 (RR16); 1-44 -GUIDELINE FOR HAND HYGIENE IN HEALTHCARE SETTINGS

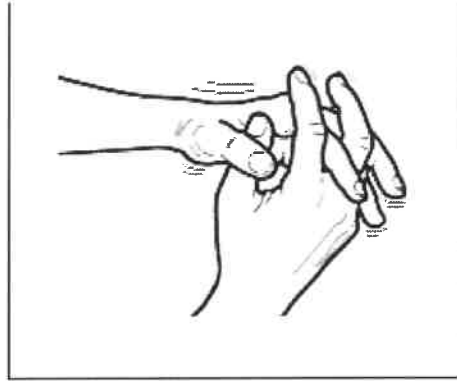
PROPER HAND WASHING TECHNIQUE

Hand Washing Technique

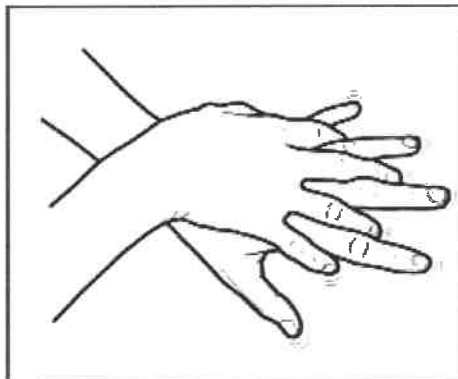
1. Use soap and water
2. Vigorously wash hands for 20 to 30 seconds, using the following pictures as guides
3. Rinse hands with water
4. Dry hands thoroughly



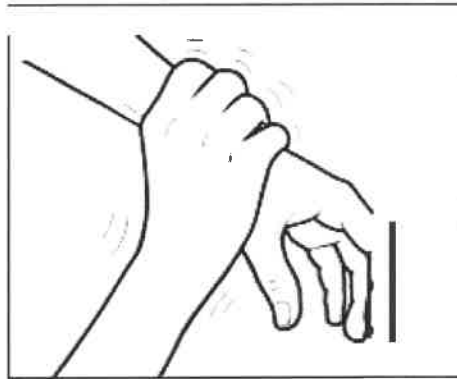
1. Wash palms



2. Wash between fingers



3. Wash back of hands



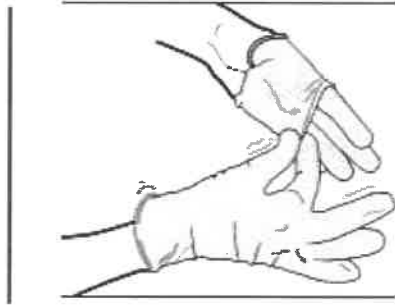
4. Wash wrists

Photocopy, place in plastic (self-adhesive laminate) and position on the wall above handbasins.

PROPER REMOVAL OF GLOVES TECHNIQUE

Removal of Gloves Technique

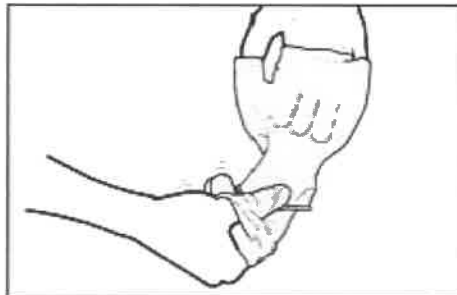
1. Use the following pictures as a guide to help you remove gloves safely
2. Avoid touching the outside of the gloves. Only touch the inside
3. Wash hands after removing and disposing of gloves in a sealable bag



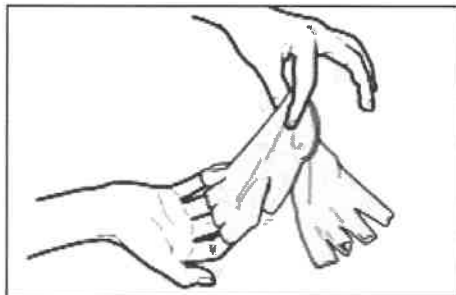
1. Grasp one glove at wrist and pull down to knuckles



2. Grasp other glove at wrist and pull down to knuckles



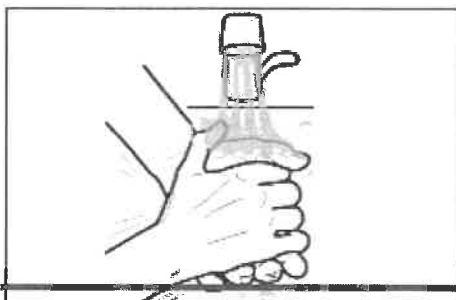
3. Grasp wrist end of one glove and pull it off completely



4. Remove other glove in a similar way, touching only the inside of gloves



5. Dispose of gloves in a sealable plastic bag



6. Wash hands after removing and disposing of gloves

Photocopy, place in plastic sleeve (or laminate) and position on the wall in first aid areas.

Hepatitis B Fact Sheet

First Anti-cancer Vaccine

Hepatitis B vaccine prevents Hepatitis B disease and its serious consequences like hepatocellular carcinoma (liver cancer). Therefore, this is the first anti-cancer vaccine.

Safe and Effective

- Medical, scientific, and public health communities strongly endorse using Hepatitis B vaccine as a safe and effective way to prevent disease and death.
- Scientific data show that Hepatitis B vaccines are very safe for infants, children, and adults.
- There is no confirmed evidence which indicates that Hepatitis B vaccine can cause chronic illnesses.
- To assure a high standard of safety with vaccines, several federal agencies continually assess and research possible or potential health effects that could be associated with vaccines.

Contraindications to Vaccine

A serious allergic reaction to a prior dose of Hepatitis B vaccine or a vaccine component is a contraindication to further doses of Hepatitis B vaccine. The recombinant vaccines that are licensed for use in the United States are synthesized by *Saccharomyces cerevisiae* (common bakers' yeast) into which a plasmid containing the gene for HBsAg has been inserted. Purified HBsAg is obtained by lysing the yeast cells and separating HBsAg from the yeast components by biochemical and biophysical techniques. Persons allergic to yeast should not be vaccinated with vaccines containing yeast.

Vaccine Schedule

- Printable childhood and adolescent immunization schedules (<http://www.cdc.gov/nip/recs/child-schedule.htm>): National Immunization Program, CDC.
- Adult Immunization Schedule (<http://www.cdc.gov/nip/recs/adult-schedule.htm>): National Immunization Program, CDC.
- If the vaccination series is interrupted after the first dose, the second dose should be administered as soon as possible. The second and third doses should be separated by an interval of at least 2 months. If only the third dose is delayed it should be administered when convenient.
- Recommended dosages and schedules of Hepatitis B vaccines (<http://www.immunize.org/catg.d/2081ab.htm>).

Booster Doses

- Current data show that vaccine-induced Hepatitis B surface antibody (anti-HBs) levels may decline over time; however immune memory (anamnestic anti-HBs response) remains intact indefinitely following immunization. Persons with declining antibody levels are still protected against clinical illness and chronic disease.
- For health care workers with normal immune status who have demonstrated an anti-HBs response following vaccination, booster doses of vaccine are not recommended, nor is periodic anti-HBs testing.

Post-vaccination Testing

- After routine vaccination of infants, children, adolescents, or adults, post-vaccination testing for adequate antibody response is not necessary.
- Post-vaccination testing IS recommended for persons whose medical management will depend on knowledge of their immune status.
- This includes persons who:
 - are immunocompromised (e.g., hemodialysis patients),
 - received the vaccine in the buttock,
 - are infants born to HBsAg (Hepatitis B surface antigen)-positive mothers,
 - are healthcare workers who have contact with blood, and
 - are sex partners of persons with chronic Hepatitis B virus infection.
- Post-vaccination testing should be completed 1-2 months after the third vaccine dose for results to be meaningful. A protective antibody response is 10 or more milli-international units (greater than or equal to 10mIU/mL).

Adverse Events

- Case reports of unusual illnesses following vaccines are most often related to other causes and not related to a vaccine. Whenever large numbers of vaccines are given some adverse events will occur coincidentally after vaccination and be falsely attributed to the vaccine.
- Anyone believing they have had a possible reaction or adverse health effect from a vaccine should report it to their health care provider. The Vaccine Adverse Events Reporting System (1-800-822-7967) receives reports from health care providers and others about vaccine side effects.

Combined Hepatitis A and Hepatitis B Vaccine

Combinations using Hepatitis A and/or Hepatitis B vaccines (<http://www.immunize.org/catg.d/2081ab.htm>).

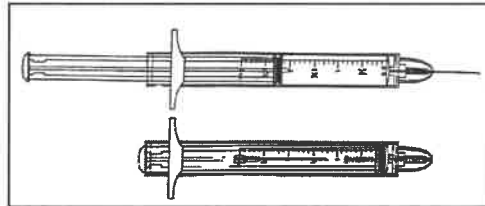
Additional Information

VFC language regarding Hepatitis B vaccines (<http://www.cdc.gov/nip/vfc/default.htm>).

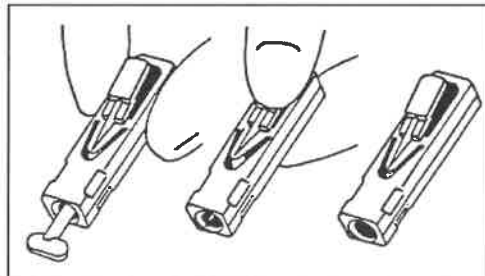
EXAMPLES OF "ENGINEERING CONTROLS"

1. **Needleless Systems** - Sharps with Engineered Sharps Injury Protections (SESIPS). These include non-needle sharps or needleless devices used for withdrawing fluids or administering medications, etc., which contain built-in safety features or mechanisms that effectively reduce the risk of an exposure incident.
 - Examples of SESIPS include: retractable needles-needles that retract into a syringe; shielded/sheathed needle devices - a sliding or movable sheath shields the attached needle; and blunt technology - a blunt needle within a hollow-bore creates a blunt tip point upon activation.

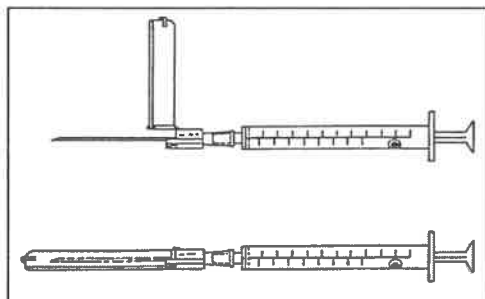
View of Retractable Needle



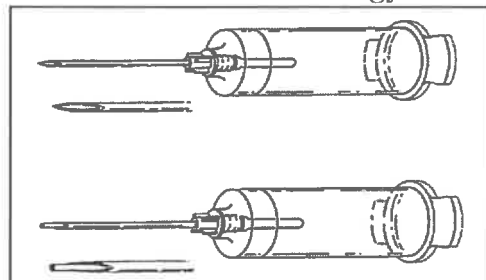
View of Retractable Lancet



View of Shielded Needle Device



View of Blunt Technology Device



The Food and Drug Administration (FDA) is responsible for clearing medical devices for marketing, although this clearance alone is not enough to guarantee the device will be effective in the workplace. The employer must rely on further evidence to ensure its effectiveness in the situations in which the devices will be used. There are specific design features for recessed needle systems that the FDA has published and agrees are important in preventing percutaneous injury.

These design features include:

- a. A fixed safety feature providing a barrier between the hands and the needle after use. The safety feature should allow or require the worker's hand to remain behind the needle at all times.
 - b. The safety feature is an integral part of the device and not an accessory.
 - c. The safety feature is in effect before disassembly and remains in effect after disposal to protect users and trash handlers and for environmental safety.
 - d. The safety feature is as simple as possible and requires little or no training to use effectively.
2. **Sharps disposal containers** - used to contain contaminated sharps (e.g., needles, razors) after use.
 3. **Plastic capillary tubes (versus glass)** - used to collect blood and reduce the risk of (hand, fingers, etc.) injuries resulting from exposure to shards broken glass from the breakage of capillary tubes.

The Food and Drug Administration (FDA), NIOSH, and OSHA recommend that users consider blood collection devices less prone to accidental breakage. These include:

- Capillary tubes that are not made of glass,
- Glass capillary tubes wrapped in puncture-resistant film,
- Products that use a method of sealing that does not require manually pushing one end of the tube into putty to form a plug, or
- Products that allow the blood hematocrit to be measured without centrifugation.

APPENDIX D

CLEANING and DECONTAMINATION SCHEDULE

NOTE: Provide Method of Decontamination for Determined Surfaces at Worksite.

Type of Surface	Type of Soil	Method of Decontamination	Schedule
Hard Smooth Non-porous (e.g., tables, chairs)	Blood Body Fluid or OPIM containing	<p>All visual fluids or materials will be removed by: EPA approved disinfectant solution.</p> <hr/> <p>Resulting towels or absorbent materials will be disposed of in: Appropriate container</p> <hr/> <p>Decontamination will occur: As soon as possible</p>	Upon occurrence of spill
Contamination gloves	Blood Body Fluid or OPIM containing	<p>Disposal of gloves will occur within: After use or a breach in the gloves' integrity.</p> <hr/>	Upon occurrence of contamination

APPENDIX E

Occupational Medical Services, Hepatitis B Vaccine Declination Form Hepatitis B disease is so infectious that one drop of blood from a Hepatitis B carrier can have 100 million infectious doses of the virus. Once infected, the disease can result in a mild infection, a chronic (lasting) infection, liver damage such as cirrhosis of the liver, liver cancer, or death due to liver failure.

Hepatitis B Vaccine is available to employees who are most at risk of blood/body fluid exposures. This is a voluntary program. Occupational Medical Services is administering the vaccine which consists of a series of three injections. The first two injections are given a month apart and the third, six months after the first. The vaccine produces protective levels in approximately 90% of healthy adults.

The vaccine, prepared from yeast cultures, ordinarily produces little or mild adverse effects, chiefly soreness at the site of injection. Other less commonly observed reactions have included redness, swelling, and hardness at the vaccination site. Infrequently, headache, nausea, muscles or joint aches occur.

I have read the above and have received the answers to my questions. My decision is indicated below:

_____ **I have already had the vaccine series.**

If you have received the vaccination series you will be asked to provide this documentation to OMS to be included as part of your employee medical record.

_____ **I decline the vaccine.**

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

_____ **I will contact OMS to schedule my vaccine by _____.**

Signature		Date
Printed Name		Job Title
Social Security Number		Department

APPENDIX F

**Montgomery County Government
Occupational Medical Services**
Authorization To Disclose Health Information

255 Rockville Pike Suite 125 Rockville MD 20850
Phone (240) 777-5118 Fax (240) 777-5132

Name:

Address:

S.S. #

Birth Date:

Telephone No:

Consent To Release Medical Information:

I hereby authorize and request that you release:

TO: Montgomery County, Occupational Medical Services Manager of OMS

From:

Address

Phone

- ☐ I will pick up this record.
☐ I give my permission to fax records
☐ I would like the information mailed directly to Montgomery County Government Occupational Medical Services.

Medical Information Requested:

The type and amount of information to be used or disclosed is as follows: (include dates where appropriate)

- ☐ Hepatitis B immunization record _____
☐ other _____

Please specify reason for release of information: Employee medical record maintenance and verification.

Authorization:

This authorization will automatically expire 60 days from the date of signature.

At that time no express revocation shall be needed to terminate my consent but I understand that I may revoke this consent at any time by sending a written notice to the Montgomery County Government Occupational Medical Services at 255 Rockville Pike, Suite 125, Rockville, MD 20850. I understand that any information which was released prior to my revocation was in compliance with this authorization and shall not constitute a breach of my rights to confidentiality.

Signature of Patient or Legal Representative	Date
If Signed by Legal Representative Signature of Witness	Date

APPENDIX G

SUPERVISOR'S BLOODBORNE PATHOGENS FORMS AND INFORMATION SECTION

MCFRS Bloodborne Pathogens Exposure Procedures Checklist

Medical Evaluation of Work Status Form

Healthcare Professional's Evaluation Report

Summary Sheet for Post-Exposure Medical Follow-up for Employees

Copy of Bloodborne Pathogens standard – 29 CFR 1910.1030

Note: Please provide the exposed employee with a copy of their Job Description for submission to his/her Licensed Healthcare Provider of choice.

(i) Montgomery County Fire and Rescue Services
(ii) Blood Borne Pathogens Exposure Supervisor's Checklist

In the event of exposure, conduct the following immediately:

- Provide immediate first aid (wash the exposed area without delay with soap and water. If blood is splashed in the eye or mucous membrane, flush the affected area with running water for at least 15 minutes)
- Notify hospital staff of exposure
- Notify the EMS Duty Officer and immediate supervisor
- Notify on-duty Safety Officer to investigate exposure / injury

Please note the following information:

- Report details of exposure to FROMS at 240-777-5185.
- After hours and weekends, report details of exposure by calling the FROMS exposure hotline at 240-777-5085 and leave details regarding the exposure.
- If FROMS is closed, seek immediate treatment in the ED. Personnel must register as a patient.
- First Report of Injury Report must be filed by the employee's supervisor online at www.mcsip.org or by calling 1-888-606-2562.
- Termination of Resuscitation Scenario: If blood can be drawn, please draw TWO serum separator tubes (aka tiger top or marble top).
- Label the tubes with "Source Patient" (not the name of the patient), the date and the PCR Report Number.
- Deliver to FROMS as soon as possible. Blood may be stored at room temperature but refrigeration is preferred.

1) Please click the link below to access the MCFRS Blood/Body Fluids/Airborne Exposure Information Form and Notification Process:

MCFRS Blood/Body Fluids/Airborne Exposure Procedures and Notification Process

Termination of Resuscitation Scenario: If blood can be drawn, please draw TWO serum separator tubes (aka tiger top or marble top). Label the tubes with "Source Patient" (not the name of the patient), the date and the PCR Report Number. Deliver to FROMS as soon as possible. Blood may be stored at room temperature but refrigeration is preferred

Montgomery County Hospitals

Holy Cross Hospital
1500 Forest Glen Road
Silver Spring, MD 20910
301-754-7000

Holy Cross Hospital / Germantown
19801 Observation Drive
Germantown, MD 20876
Phone: 301-557-6000

Medstar Montgomery Medical Center
18101 Prince Philip Drive
Olney, MD 20832
301-774-8882

Shady Grove Adventist Hospital
9901 Medical Center Drive
Rockville, MD 20850
301-279-6000

Shady Grove Adventist Emergency Center
19731 Germantown Road
Germantown, MD 20874
301-441-8000

Suburban Hospital
8600 Old Georgetown Road
Bethesda, MD 20814
301-896-3100

Washington Adventist Hospital
7600 Carroll Avenue
Takoma Park, MD 20912
301-891-7600

Treatment After Normal Business Hours (Medical Access hours)

If treatment is required after hours, the emergency physician will administer the necessary medication. However if this is not possible and there are immediate pharmaceutical needs, the supervisor should visit the Montgomery County Self-Insurance Program website www.mcsip.org. Within the website there is a link for First Script, MCI's team partner managing Workers' Compensation Drug Plans.

To assist the employee, the supervisor should print a First Fill Card (temporary pharmacy card). Providing a First Fill Card eliminates the need for out-of-pocket expenses thus making the process convenient for the employee. Alternatively, if preferred there is also the option to call First Script's toll free (866) 445-7344 for a pharmacy location.

24-Hour Pharmacy Locations

First Script has several locations within Montgomery County and surrounding areas. Please visit www.mcsip.org, select the link to First Script and follow instructions for pharmacy locator. Representatives are also available by phone 24-hours a day at (866) 445-7344.

The following locations provide 24-hour pharmacy services:

CVS Locations

**1580 Rockville Pike
Rockville, MD 20852**

Front Store Phone: (301) 881-6070
Pharmacy Phone: (301) 881-6070
Front Store Hours: Open 24 hours
Pharmacy Hours: Open 24 Hours

**7955 Tuckerman Lane
Rockville, MD 20854**

Front Store Phone: (301) 299-3717
Pharmacy Phone: (301) 299-3717
Front Store Hours: Open 24 hours
Pharmacy Hours: Open 24 Hours

**9920 Key West Avenue
Rockville, MD 20850**

Front Store Phone: (301) 251-0024
Pharmacy Phone: (301) 251-0024
Front Store Hours: Open 24 hours
Pharmacy Hours: Open 24 Hours

Walgreens Locations

**25 High Street
Waldorf, MD 20602**

301-932-9826
SEC of St Ignatius Dr & St Charles Pkwy

**7953 Crain Hwy-S Glen
Burnie, MD 21061**

410-969-3417
NEC of Robert Crain Highway (SH 3) & Crainmont Drive

**6700 Ritchie Hwy
Glen Burnie, MD 21061**

443-848-0245
SWC of Gov Ritchie Hwy & Ordnance

5657 Baltimore National Pike	410-788-1207
Catonsville, MD 21228	SEC of Ingleside & Route 40
8050 Liberty Road	410-496-2117
Baltimore, MD 21244	NEC of Milford Mill Road & Liberty Road (S.H. 26)
4025 W Northern Pkwy	410-764-9570
Baltimore, MD 21215	SEC of Reisterstown Road & Northern Parkway
276 W. Lee Hwy	540-347-5917
Warrenton, VA 20186	SEC of Winchester & Lee Hwy
4020 Eastern Ave	410-534-8656
Baltimore, MD 21224	NWC of Haven Street & Eastern Avenue
9616 Harford Rd	410-663-7957
Baltimore, MD 21234	NWC of Harford & Joppa
9621 Belair Road	410-529-2864
Baltimore, MD 21236	NEC of Belair Road & Chapel Road
401 Compass Rd E	410-780-4770
Baltimore, MD 21220	NEC of Compass Rd & Martin Blvd (S R 70)

MEDICAL EVALUATION OF WORK STATUS

DEPARTMENT OF FIRE AND RESCUE SERVICES MONTGOMERY COUNTY, MARYLAND

PLEASE TYPE OR PRINT ALL INFORMATION CLEARLY

DATE OF THIS REPORT

EMPLOYEE'S NAME

JOB TITLE:

LAST

MI

FIRST

DIAGNOSIS (OMS USE ONLY):

CURRENT TREATMENT & PROGNOSIS (FOR OMS ONLY):

DATE OF NEXT APPOINTMENT (RE-EVALUATION):

FOR LICENSED HEALTH CARE PROVIDER'S USE ONLY- PLEASE CHECK ONE BOX ONLY.

- ☐ **FULL DUTY:** Employee is qualified to work in FULL DUTY status, without physical restrictions.
Note: Duty status in this category includes all activities listed in the Firefighter/Rescuer Position Description on the back of this form.

- ☐ **LIGHT DUTY:** Employee is not qualified for full duty at this time. Employee can work in a temporary, Light Duty capacity for Montgomery County Fire Rescue Services, at the discretion of the employer. Light Duty positions are not permanent positions. Light Duty assignments are generally clerical or administrative in nature, and include working either 4-10 hour days or 5-8 hour days.

___ May only lift/carry up to ___ lbs.

___ May not push/pull objects

___ May not use fingers (poor dexterity)

___ May not stand/walk

___ May not climb ladders/ropes

___ May not be exposed to excessive heat

___ May not be exposed to excessive cold

___ May not be exposed to excessive humidity

___ May not be exposed to excessive noise

___ May not be exposed to intense light

___ May not work in enclosed, cramped spaces

___ May not sit for extended periods of time

___ May not reach above shoulder

___ May not use right hand/arm

___ May not use left hand/arm

___ May not climb stairs/ramps

___ May not bend, stoop, lean, crawl on hands and knees

___ May not drive vehicles with automatic transmission

___ May not drive vehicles *with* manual transmission

___ May not be exposed to excessive dryness

___ May not be exposed to contact vibrations

___ May not be exposed to fumes, smoke, gasses, odors

___ May not be exposed to the elements (outdoor, weather)

___ Employee is taking medications with the following side effects: _____

Other: _____

Date of anticipated improvement so that employee may start full duty: _____

IF "NO DUTY" STATUS IS NECESSARY, PLEASE FILL OUT THE NEXT SECTION COMPLETELY:

- ☐ **NO DUTY:** Employee is temporarily incapacitated and unable to perform any work.

Employee is on home rest/hospital rest for _____ days

Date of anticipated improvement so that employee may start light duty _____

Date of anticipated improvement so that employee may start full duty _____

REMARKS _____

THIS REPORT IS:

☐ INITIAL

☐ EXTENSION

LICENSED HEALTH CARE PROVIDER (LHCP):

I have read and understand the information on position descriptions for full and light duty as described on the front and back of this page.

LHCP PHONE#

() -

SUPERVISOR'S EXPOSURE INCIDENT INVESTIGATION REPORT

This section is to be completed by supervisor. Fax to Risk Management/Safety: (240) 777-8914

Department/Division:	Date of Incident:	Time of Incident: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
Location (Indicate By Building, Room, Worksite, Or In Relation To Known Fixed Object):		
Employee(s) Exposed:	Job Title(s):	
Potentially Infectious Materials Involved:		
Type:	Source:	
Circumstances (work being performed, etc.):		
Has Employee Received Bloodborne Pathogens Training? <input type="checkbox"/> Yes, if yes include by whom? <input type="checkbox"/> No		
How Incident Was Caused (accident equipment malfunction etc): <input type="checkbox"/> Unsafe Act <input type="checkbox"/> Unsafe Condition:		
Device Description:		
Corrective Actions Taken (decontamination clean-up reporting etc.):		
Engineering Controls/Personal Protective Equipment In Use:		
Supervisor's Comments/Recommendations:		
Supervisor/Manager:	Date:	

**Montgomery County Government
Occupational Medical Services**

255 Rockville Pike, Suite 125, Rockville, MD 20850
Phone (240) 777-5118, Fax (240) 777-5132

To comply with the Bloodborne Pathogens standard (29 CFR 1910.1030), Montgomery County Government requests the evaluating healthcare professional send a copy of his/her written opinion upon the completion of the evaluation, preferably within 10 calendar days, but no later than 14 days after providing treatment for the exposed employee. Please mail or fax the completed report to Occupational Medical Services. A copy of the Bloodborne Pathogens standard (29 CFR 1910.1030) has been provided to you (evaluating healthcare professional) along with the exposure report.

Healthcare Professional's Evaluation Report (also known as the "Blood/Body Fluid Exposure" Report)

Employee's Name:

SS #:

Address - Work:

Home:

Phone - Work:

Home:

Date of Exposure:

Date of Evaluation:

Hepatitis B vaccination is indicated:

☐ Yes

☐ No

Hepatitis B Vaccine given at this facility:

☐ Yes

☐ No

☐ Yes ☐ No

The employee has been informed of the results of the evaluation.

☐ Yes ☐ No

The employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

☐ Yes ☐ No

All other findings or diagnoses remain confidential and are not included in this written opinion.

A copy of this report has been provided to the employee? ☐ Yes

☐ No [MUST STATE WHY]

Other comments :

Healthcare Professional's Printed Name:

Healthcare Professional's Signature:

Date:

SUMMARY SHEET FOR POST-EXPOSURE MEDICAL FOLLOW-UP FOR EMPLOYEES

This summarizes three options for employees who seek medical attention following a work-related Bloodborne Pathogens exposure.

1. Fire and Rescue Occupational Medical Services (FROMS) – specializes in occupational injuries

- Physician – Board Certified in Infectious Disease, Internal Medicine, Occupational Medicine, or Emergency Medicine, or designee will consult with exposed employee to determine if the event is an exposure.
- If so, FROMS will advise as to the level of risk and the level of care indicated.
- If after hours care is indicated, FROMS will contact the local emergency room with treatment and testing recommendations in advance of the employee's arrival and will discuss initiating Post-Exposure Prophylaxis. The local emergency room physician will initiate the Prophylaxis if indicated.
- Will advise emergency room physician as to the need for Hepatitis B titer or vaccine if possible.
- FROMS will perform all follow-up testing.
- FROMS conducts the post-exposure counseling.
- FROMS maintains record of Medical Evaluation of Work Status and conducts all follow-up visits and treatment.
- FROMS, upon notification from OMS, will contact the source patient and perform testing or arrange source testing at another site if the employee requests it.

2. Local Emergency Room or Urgent Care Center

- Will initiate Post-Exposure Prophylaxis if indicated by the circumstances of the event.
- May administer HBIG.
- Should complete Medical Evaluation of Work Status form and give to employee to return to FROMS.
- Maintains record of emergent or urgent treatment.
- Will initiate post exposure counseling to the employee.
- Will conduct source testing.

3. Private Provider

- May test for HIV, Hepatitis B, and Hepatitis C.
- May initiate Post-Exposure Prophylaxis if indicated by the event.
- May administer HBIG.
- May advise you as to the need for, or administer the Hepatitis B vaccine.
- Should complete Medical Evaluation of Work Status form and the Healthcare Professional's Evaluation Report and give to the employee to return to FROMS.
- Maintains records of treatment.
- May do post-exposure counseling and follow up tests and visits.
- May not conduct source testing.

Note: Employee should take copy of OSHA standard if electing treatment with private provider to assure awareness of OSHA requirements.

Montgomery County Fire and Rescue Service

Infection Control Plan

Regulations (Standards - 29 CFR) Bloodborne pathogens. - 1910.1030

1910.1030(a) Scope and Application. This section applies to all occupational exposure to blood or other potentially infectious materials as defined by paragraph (b) of this section.

1910.1030(b) Definitions. For purposes of this section, the following shall apply:

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.

Blood means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Clinical Laboratory means a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Director means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designated representative.

Engineering Controls means controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Handwashing Facilities means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

Licensed Healthcare Professional is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV means Hepatitis B virus.

HIV means human immunodeficiency virus.

Needleless systems means a device that does not use needles for:

(1) The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established; (2) The administration of medication or fluids; or (3) Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.

Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Production Facility means a facility engaged in industrial-scale, large-volume or high concentration production of HIV or HBV.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Research Laboratory means a laboratory producing or using research-laboratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

Sharps with engineered sharps injury protections means a nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

Source Individual means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

Sterilize means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

1910.1030(c) Exposure Control –

1910.1030(c)(1) Exposure Control Plan.

1910.1030(c)(1)(i) Each employer having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall establish a written Exposure Control Plan designed to eliminate or minimize employee exposure.

1910.1030(c)(1)(ii) The Exposure Control Plan shall contain at least the following elements:

1910.1030(c)(1)(ii)(A) The exposure determination required by paragraph (c)(2),

1910.1030(c)(1)(ii)(B) The schedule and method of implementation for paragraphs (d) Methods of Compliance, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, (g) Communication of Hazards to Employees, and (h) Recordkeeping, of this standard, and

1910.1030(c)(1)(ii)(C) The procedure for the evaluation of circumstances surrounding exposure incidents as required by paragraph (f)(3)(i) of this standard.

1910.1030(c)(1)(iii) Each employer shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.1020(e).

1910.1030(c)(1)(iv) The Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure. The review and update of such plans shall also:

1910.1030(c)(1)(iv)(A) Reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens; and

1910.1030(c)(1)(iv)(B) Document annually consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.

1910.1030(c)(1)(v) An employer, who is required to establish an Exposure Control Plan shall solicit input from non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps in the identification, evaluation, and selection of effective engineering and work practice controls and shall document the solicitation in the Exposure Control Plan.

1910.1030(c)(1)(vi) The Exposure Control Plan shall be made available to the Assistant Secretary and the Director upon request for examination and copying.

1910.1030(c)(2) Exposure Determination.

1910.1030(c)(2)(i) Each employer who has an employee(s) with occupational exposure as defined by paragraph (b) of this section shall prepare an exposure determination. This exposure determination shall contain the following:

1910.1030(c)(2)(i)(A) A list of all job classifications in which all employees in those job classifications have occupational exposure;

1910.1030(c)(2)(i)(B) A list of job classifications in which some employees have occupational exposure, and

1910.1030(c)(2)(i)(C) A list of all tasks and procedures or groups of closely related tasks and procedures in which occupational exposure occurs and that are performed by employees in job classifications listed in accordance with the provisions of paragraph (c)(2)(i)(B) of this standard.

1910.1030(c)(2)(ii) This exposure determination shall be made without regard to the use of personal protective equipment.

1910.1030(d) Methods of Compliance –

1910.1030(d)(1) General. Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

1910.1030(d)(2) Engineering and Work Practice Controls.

1910.1030(d)(2)(i) Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

1910.1030(d)(2)(ii) Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness.

1910.1030(d)(2)(iii) Employers shall provide handwashing facilities which are readily accessible to employees.

1910.1030(d)(2)(iv) When provision of handwashing facilities is not feasible, the employer shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.

1910.1030(d)(2)(v) Employers shall ensure that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.

1910.1030(d)(2)(vi) Employers shall ensure that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials.

1910.1030(d)(2)(vii) Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted in paragraphs (d)(2)(vii)(A) and (d)(2)(vii)(B) below. Shearing or breaking of contaminated needles is prohibited.

1910.1030(d)(2)(vii)(A) Contaminated needles and other contaminated sharps shall not be bent, recapped or removed unless the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure.

1910.1030(d)(2)(vii)(B) Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

1910.1030(d)(2)(viii) Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed. These containers shall be:

1910.1030(d)(2)(viii)(A) Puncture resistant;

1910.1030(d)(2)(viii)(B) Labeled or color-coded in accordance with this standard;

1910.1030(d)(2)(v iii)(C) Leakproof on the sides and bottom; and

1910.1030(d)(2)(v iii)(D) In accordance with the requirements set forth in paragraph (d)(4)(ii)(E) for reusable sharps.

1910.1030(d)(2)(ix) Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

1910.1030(d)(2)(x) Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.

1910.1030(d)(2)(xi) All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

1910.1030(d)(2)(xii) Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

1910.1030(d)(2)(xiii) Specimens of blood or other potentially infectious materials shall be placed in a container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

1910.1030(d)(2)(xiii)(A) The container for storage, transport, or shipping shall be labeled or color-coded according to paragraph (g)(1)(i) and closed prior to being stored, transported, or shipped. When a facility utilizes Universal Precautions in the handling of all specimens, the labeling/color-coding of specimens is not necessary provided containers are recognizable as containing specimens. This exemption only applies while such specimens/containers remain within the facility. Labeling or color-coding in accordance with paragraph (g)(1)(i) is required when such specimens/containers leave the facility.

1910.1030(d)(2)(xiii)(B) If outside contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color-coded according to the requirements of this standard.

1910.1030(d)(2)(xiii)(C) If the specimen could puncture the primary container, the primary container shall be placed within a secondary container which is puncture-resistant in addition to the above characteristics.

1910.1030(d)(2)(xiv) Equipment which may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the employer can demonstrate that decontamination of such equipment or portions of such equipment is not feasible.

1910.1030(d)(2)(xiv)(A) A readily observable label in accordance with paragraph (g)(1)(i)(H) shall be attached to the equipment stating which portions remain contaminated.

1910.1030(d)(2)(xiv)(B) The employer shall ensure that this information is conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.

1910.1030(d)(3) Personal Protective Equipment –

1910.1030(d)(3)(i) Provision. When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other

ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

1910.1030(d)(3)(ii) Use. The employer shall ensure that the employee uses appropriate personal protective equipment unless the employer shows that the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was the employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgment, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent such occurrences in the future.

1910.1030(d)(3)(iii) Accessibility. The employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

1910.1030(d)(3)(iv) Cleaning, Laundering, and Disposal. The employer shall clean, launder, and dispose of personal protective equipment required by paragraphs (d) and (e) of this standard, at no cost to the employee.

1910.1030(d)(3)(v) Repair and Replacement. The employer shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

1910.1030(d)(3)(vi) If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.

1910.1030(d)(3)(vii) All personal protective equipment shall be removed prior to leaving the work area.

1910.1030(d)(3)(viii) When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

1910.1030(d)(3)(ix) Gloves. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces.

1910.1030(d)(3)(ix)(A) Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

1910.1030(d)(3)(ix)(B) Disposable (single use) gloves shall not be washed or decontaminated for re-use.

1910.1030(d)(3)(ix)(C) Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

1910.1030(d)(3)(ix)(D) If an employer in a volunteer blood donation center judges that routine gloving for all phlebotomies is not necessary then the employer shall:

1910.1030(d)(3)(ix)(D)(1) Periodically reevaluate this policy;

Montgomery County Fire and Rescue Service Infection Control Plan

1910.1030(d)(3)(ix)(D)(2) Make gloves available to all employees who wish to use them for phlebotomy;

1910.1030(d)(3)(ix)(D)(3) Not discourage the use of gloves for phlebotomy; and

1910.1030(d)(3)(ix)(D)(4) Require that gloves be used for phlebotomy in the following circumstances:

1910.1030(d)(3)(ix)(D)(4)(i) When the employee has cuts, scratches, or other breaks in his or her skin;

1910.1030(d)(3)(ix)(D)(4)(ii) When the employee judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative source individual; and

1910.1030(d)(3)(ix)(D)(4)(iii) When the employee is receiving training in phlebotomy.

1910.1030(d)(3)(x) Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

1910.1030(d)(3)(xi) Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

1910.1030(d)(3)(xii) Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated (e.g., autopsies, orthopedic surgery).

1910.1030(d)(4) Housekeeping –

1910.1030(d)(4)(i) General. Employers shall ensure that the worksite is maintained in a clean and sanitary condition. The employer shall determine and implement an appropriate written schedule for cleaning and method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

1910.1030(d)(4)(ii) All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

1910.1030(d)(4)(ii)(A) Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures; immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials; and at the end of the workshift if the surface may have become contaminated since the last cleaning.

1910.1030(d)(4)(ii)(B) Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.

1910.1030(d)(4)(ii)(C) All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

1910.1030(d)(4)(ii)(D) Broken glassware which may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means, such as a brush and dust pan, tongs, or forceps.

1910.1030(d)(4)(ii)(E) Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

1910.1030(d)(4)(iii) Regulated Waste –

1910.1030(d)(4)(iii)(A) Contaminated Sharps Discarding and Containment.

1910.1030(d)(4)(iii)(A)(1) Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

1910.1030(d)(4)(iii)(A)(1)(i) Closable;

1910.1030(d)(4)(iii)(A)(1)(ii) Puncture resistant;

1910.1030(d)(4)(iii)(A)(1)(iii) Leakproof on sides and bottom; and

1910.1030(d)(4)(iii)(A)(1)(iv) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard.

1910.1030(d)(4)(iii)(A)(2) During use, containers for contaminated sharps shall be:

1910.1030(d)(4)(iii)(A)(2)(i) Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries);

1910.1030(d)(4)(iii)(A)(2)(ii) Maintained upright throughout use; and

1910.1030(d)(4)(iii)(A)(2)(iii) Replaced routinely and not be allowed to overfill.

1910.1030(d)(4)(iii)(A)(3) When moving containers of contaminated sharps from the area of use, the containers shall be:

1910.1030(d)(4)(iii)(A)(3)(i) Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;

1910.1030(d)(4)(iii)(A)(3)(ii) Placed in a secondary container if leakage is possible. The second container shall be:

1910.1030(d)(4)(iii)(A)(3)(ii)(A) Closable;

1910.1030(d)(4)(iii)(A)(3)(ii)(B) Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and

1910.1030(d)(4)(iii)(A)(3)(ii)(C) Labeled or color-coded according to paragraph (g)(1)(i) of this standard.

1910.1030(d)(4)(iii)(A)(4) Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner which would expose employees to the risk of percutaneous injury.

1910.1030(d)(4)(iii)(B) Other Regulated Waste Containment –

1910.1030(d)(4)(iii)(B)(1) Regulated waste shall be placed in containers which are:

1910.1030(d)(4)(iii)(B)(1)(i) Closable;

1910.1030(d)(4)(iii)(B)(1)(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

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1910.1030(d)(4)(iii)(B)(1)(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and

1910.1030(d)(4)(iii)(B)(1)(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

1910.1030(d)(4)(iii)(B)(2) If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:

1910.1030(d)(4)(iii)(B)(2)(i) Closable;

1910.1030(d)(4)(iii)(B)(2)(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

1910.1030(d)(4)(iii)(B)(2)(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and

1910.1030(d)(4)(iii)(B)(2)(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

1910.1030(d)(4)(iii)(C) Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, States and Territories, and political subdivisions of States and Territories.

1910.1030(d)(4)(iv) Laundry.

1910.1030(d)(4)(iv)(A) Contaminated laundry shall be handled as little as possible with a minimum of agitation.

1910.1030(d)(4)(iv)(A)(1) Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.

1910.1030(d)(4)(iv)(A)(2) Contaminated laundry shall be placed and transported in bags or containers labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard. When a facility utilizes Universal Precautions in the handling of all soiled laundry, alternative labeling or color-coding is sufficient if it permits all employees to recognize the containers as requiring compliance with Universal Precautions.

1910.1030(d)(4)(iv)(A)(3) Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through or leakage from the bag or container, the laundry shall be placed and transported in bags or containers which prevent soak-through and/or leakage of fluids to the exterior.

1910.1030(d)(4)(iv)(B) The employer shall ensure that employees who have contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

1910.1030(d)(4)(iv)(C) When a facility ships contaminated laundry off-site to a second facility which does not utilize Universal Precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers which are labeled or color-coded in accordance with paragraph (g)(1)(i).

1910.1030(e) HIV and HBV Research Laboratories and Production Facilities.

1910.1030(e)(1) This paragraph applies to research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV and HBV. It does not apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs. These requirements apply in addition to the other requirements of the standard.

1910.1030(e)(2) Research laboratories and production facilities shall meet the following criteria:

1910.1030(e)(2)(i) Standard Microbiological Practices. All regulated waste shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

1910.1030(e)(2)(ii) Special Practices.

1910.1030(e)(2)(ii)(A) Laboratory doors shall be kept closed when work involving HIV or HBV is in progress.

1910.1030(e)(2)(ii)(B) Contaminated materials that are to be decontaminated at a site away from the work area shall be placed in a durable, leakproof, labeled or color-coded container that is closed before being removed from the work area.

1910.1030(e)(2)(ii)(C) Access to the work area shall be limited to authorized persons. Written policies and procedures shall be established whereby only persons who have been advised of the potential biohazard, who meet any specific entry requirements, and who comply with all entry and exit procedures shall be allowed to enter the work areas and animal rooms.

1910.1030(e)(2)(ii)(D) When other potentially infectious materials or infected animals are present in the work area or containment module, a hazard warning sign incorporating the universal biohazard symbol shall be posted on all access doors. The hazard warning sign shall comply with paragraph (g)(1)(ii) of this standard.

1910.1030(e)(2)(ii)(E) All activities involving other potentially infectious materials shall be conducted in biological safety cabinets or other physical-containment devices within the containment module. No work with these other potentially infectious materials shall be conducted on the open bench.

1910.1030(e)(2)(ii)(F) Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing shall be used in the work area and animal rooms. Protective clothing shall not be worn outside of the work area and shall be decontaminated before being laundered.

1910.1030(e)(2)(ii)(G) Special care shall be taken to avoid skin contact with other potentially infectious materials. Gloves shall be worn when handling infected animals and when making hand contact with other potentially infectious materials is unavoidable.

1910.1030(e)(2)(ii)(H) Before disposal all waste from work areas and from animal rooms shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

1910.1030(e)(2)(ii)(I) Vacuum lines shall be protected with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and which are checked routinely and maintained or replaced as necessary.

1910.1030(e)(2)(ii)(J) Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., the needle is integral to the syringe) shall be used for the injection or aspiration of other potentially infectious materials. Extreme caution shall be used when handling needles and syringes. A needle shall not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe shall be promptly placed in a puncture-resistant container and autoclaved or decontaminated before reuse or disposal.

1910.1030(e)(2)(ii)(K) All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly

trained and equipped to work with potentially concentrated infectious materials.

1910.1030(e)(2)(ii)(L) A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person.

1910.1030(e)(2)(ii)(M) A biosafety manual shall be prepared or adopted and periodically reviewed and updated at least annually or more often if necessary. Personnel shall be advised of potential hazards, shall be required to read instructions on practices and procedures, and shall be required to follow them.

1910.1030(e)(2)(iii) Containment Equipment.

1910.1030(e)(2)(iii)(A) Certified biological safety cabinets (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices, such as special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

1910.1030(e)(2)(iii)(B) Biological safety cabinets shall be certified when installed, whenever they are moved and at least annually.

1910.1030(e)(3) HIV and HBV research laboratories shall meet the following criteria:

1910.1030(e)(3)(i) Each laboratory shall contain a facility for hand washing and an eye wash facility which is readily available within the work area.

1910.1030(e)(3)(ii) An autoclave for decontamination of regulated waste shall be available.

1910.1030(e)(4) HIV and HBV production facilities shall meet the following criteria:

1910.1030(e)(4)(i) The work area shall be separated from areas that are open to unrestricted traffic flow within the building. Passage through two sets of doors shall be the basic requirement for entry into the work area from access corridors or other contiguous areas. Physical separation of the high-containment work area from access corridors or other areas or activities may also be provided by a double-doored clothes-change room (showers may be included), airlock, or other access facility that requires passing through two sets of doors before entering the work area.

1910.1030(e)(4)(ii) The surfaces of doors, walls, floors and ceilings in the work area shall be water resistant so that they can be easily cleaned. Penetrations in these surfaces shall be sealed or capable of being sealed to facilitate decontamination.

1910.1030(e)(4)(iii) Each work area shall contain a sink for washing hands and a readily available eye wash facility. The sink shall be foot, elbow, or automatically operated and shall be located near the exit door of the work area.

1910.1030(e)(4)(iv) Access doors to the work area or containment module shall be self-closing.

1910.1030(e)(4)(v) An autoclave for decontamination of regulated waste shall be available within or as near as possible to the work area.

1910.1030(e)(4)(vi) A ducted exhaust-air ventilation system shall be provided. This system shall create directional airflow that draws air into the work area through the entry area. The exhaust air shall not be recirculated to any other area of the building, shall be discharged to the outside, and shall be dispersed away from occupied areas and air intakes. The proper direction of the airflow shall be verified (i.e., into the work area).

1910.1030(e)(5) Training Requirements. Additional training requirements for employees in HIV and HBV research laboratories and HIV and HBV production facilities are specified in paragraph (g)(2)(ix).

1910.1030(f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up –

1910.1030(f)(1) General.

1910.1030(f)(1)(i) The employer shall make available the Hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident.

1910.1030(f)(1)(ii) The employer shall ensure that all medical evaluations and procedures including the Hepatitis B vaccine and vaccination series and post-exposure evaluation and follow-up, including prophylaxis, are:

1910.1030(f)(1)(ii)(A) Made available at no cost to the employee;

1910.1030(f)(1)(ii)(B) Made available to the employee at a reasonable time and place;

1910.1030(f)(1)(ii)(C) Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and

1910.1030(f)(1)(ii)(D) Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures take place, except as specified by this paragraph (f).

1910.1030(f)(1)(iii) The employer shall ensure that all laboratory tests are conducted by an accredited laboratory at no cost to the employee.

1910.1030(f)(2) Hepatitis B Vaccination.

1910.1030(f)(2)(i) Hepatitis B vaccination shall be made available after the employee has received the training required in paragraph (g)(2)(vii)(I) and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete Hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.

1910.1030(f)(2)(ii) The employer shall not make participation in a prescreening program a prerequisite for receiving Hepatitis B vaccination.

1910.1030(f)(2)(iii) If the employee initially declines Hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the employer shall make available Hepatitis B vaccination at that time.

1910.1030(f)(2)(iv) The employer shall assure that employees who decline to accept Hepatitis B vaccination offered by the employer sign the statement in Appendix A.

1910.1030(f)(2)(v) If a routine booster dose(s) of Hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available in accordance with section (f)(1)(ii).

1910.1030(f)(3) Post-exposure Evaluation and Follow-up. Following a report of an exposure incident, the employer shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:

1910.1030(f)(3)(i) Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred;

1910.1030(f)(3)(ii) Identification and documentation of the source individual, unless the employer can establish that identification is infeasible or prohibited by state or local law;

1910.1030(f)(3)(ii)(A) The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity. If consent is not obtained, the employer shall establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the results documented.

1910.1030(f)(3)(ii)(B) When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

1910.1030(f)(3)(ii)(C) Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

1910.1030(f)(3)(iii) Collection and testing of blood for HBV and HIV serological status;

1910.1030(f)(3)(iii)(A) The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.

1910.1030(f)(3)(iii)(B) If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least 90 days. If, within 90 days of the exposure incident, the employee elects to have the baseline sample tested, such testing shall be done as soon as feasible.

1910.1030(f)(3)(iv) Post-exposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service;

1910.1030(f)(3)(v) Counseling; and

1910.1030(f)(3)(vi) Evaluation of reported illnesses.

1910.1030(f)(4) Information Provided to the Healthcare Professional.

1910.1030(f)(4)(i) The employer shall ensure that the healthcare professional responsible for the employee's Hepatitis B vaccination is provided a copy of this regulation.

1910.1030(f)(4)(ii) The employer shall ensure that the healthcare professional evaluating an employee after an exposure incident is provided the following information:

1910.1030(f)(4)(ii)(A) A copy of this regulation;

1910.1030(f)(4)(ii)(B) A description of the exposed employee's duties as they relate to the exposure incident;

1910.1030(f)(4)(ii)(C) Documentation of the route(s) of exposure and circumstances under which exposure occurred;

1910.1030(f)(4)(ii)(D) Results of the source individual's blood testing, if available; and

1910.1030(f)(4)(ii)(E) All medical records relevant to the appropriate treatment of the employee including vaccination status which are the employer's responsibility to maintain.

1910.1030(f)(5) Healthcare Professional's Written Opinion. The employer shall obtain and provide the employee with a copy of the

evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

1910.1030(f)(5)(i) The healthcare professional's written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.

1910.1030(f)(5)(ii) The healthcare professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following information:

1910.1030(f)(5)(ii)(A) That the employee has been informed of the results of the evaluation; and

1910.1030(f)(5)(ii)(B) That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

1910.1030(f)(5)(iii) All other findings or diagnoses shall remain confidential and shall not be included in the written report.

1910.1030(f)(6) Medical Recordkeeping. Medical records required by this standard shall be maintained in accordance with paragraph (h)(1) of this section.

1910.1030(g) Communication of Hazards to Employees –

1910.1030(g)(1) Labels and Signs –

1910.1030(g)(1)(i) Labels.

1910.1030(g)(1)(i)(A) Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious materials, except as provided in paragraph (g)(1)(i)(E), (F) and (G).

1910.1030(g)(1)(i)(B) Labels required by this section shall include the following legend:



1910.1030(g)(1)(i)(C) These labels shall be fluorescent orange or orange-red or predominantly so, with lettering and symbols in a contrasting color.

1910.1030(g)(1)(i)(D) Labels shall be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

1910.1030(g)(1)(i)(E) Red bags or red containers may be substituted for labels.

1910.1030(g)(1)(i)(F) Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of paragraph (g).

1910.1030(g)(1)(i)(G) Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal are exempted from the labeling requirement.

1910.1030(g)(1)(i)(H) Labels required for contaminated equipment shall be in accordance with this paragraph and shall also state which portions of the equipment remain contaminated.

1910.1030(g)(1)(i)(I) Regulated waste that has been decontaminated need not be labeled or color-coded.

1910.1030(g)(1)(ii) Signs.

1910.1030(g)(1)(ii)(A) The employer shall post signs at the entrance to work areas specified in paragraph (e), HIV and HBV Research Laboratory and Production Facilities, which shall bear the following legend:



(Name of the Infectious Agent)
(Special requirements for entering the area)
(Name, telephone number of the laboratory director or other responsible person.)

1910.1030(g)(1)(ii)(B) These signs shall be fluorescent orange-red or predominantly so, with lettering and symbols in a contrasting color.

1910.1030(g)(2) Information and Training.

1910.1030(g)(2)(i) Employers shall ensure that all employees with occupational exposure participate in a training program which must be provided at no cost to the employee and during working hours.

1910.1030(g)(2)(ii) Training shall be provided as follows:

1910.1030(g)(2)(ii)(A) At the time of initial assignment to tasks where occupational exposure may take place;

1910.1030(g)(2)(ii)(B) At least annually thereafter.

1910.1030(g)(2)(iii) [Reserved]

1910.1030(g)(2)(iv) Annual training for all employees shall be provided within one year of their previous training.

1910.1030(g)(2)(v) Employers shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

1910.1030(g)(2)(vi) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

1910.1030(g)(2)(vii) The training program shall contain at a minimum the following elements:

1910.1030(g)(2)(vii)(A) An accessible copy of the regulatory text of this standard and an explanation of its contents;

1910.1030(g)(2)(vii)(B) A general explanation of the epidemiology and symptoms of bloodborne diseases;

1910.1030(g)(2)(vii)(C) An explanation of the modes of transmission of bloodborne pathogens;

1910.1030(g)(2)(vii)(D) An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;

1910.1030(g)(2)(vii)(E) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;

1910.1030(g)(2)(vii)(F) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;

1910.1030(g)(2)(vii)(G) Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;

1910.1030(g)(2)(vii)(H) An explanation of the basis for selection of personal protective equipment;

1910.1030(g)(2)(vii)(I) Information on the Hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;

1910.1030(g)(2)(vii)(J) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;

1910.1030(g)(2)(vii)(K) An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;

1910.1030(g)(2)(vii)(L) Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;

1910.1030(g)(2)(vii)(M) An explanation of the signs and labels and/or color coding required by paragraph (g)(1); and

1910.1030(g)(2)(vii)(N) An opportunity for interactive questions and answers with the person conducting the training session.

1910.1030(g)(2)(viii) The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

1910.1030(g)(2)(ix) Additional Initial Training for Employees in HIV and HBV Laboratories and Production Facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following initial training in addition to the above training requirements.

1910.1030(g)(2)(ix)(A) The employer shall assure that employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.

1910.1030(g)(2)(ix)(B) The employer shall assure that employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV.

1910.1030(g)(2)(ix)(C) The employer shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activities shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The employer shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

1910.1030(h) Recordkeeping –

1910.1030(h)(1) Medical Records.

Montgomery County Fire and Rescue Service
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1910.1030(h)(1)(i) The employer shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.1020.

1910.1030(h)(1)(ii) This record shall include:

1910.1030(h)(1)(ii)(A) The name and social security number of the employee;

1910.1030(h)(1)(ii)(B) A copy of the employee's Hepatitis B vaccination status including the dates of all the Hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination as required by paragraph (f)(2);

1910.1030(h)(1)(ii)(C) A copy of all results of examinations, medical testing, and follow-up procedures as required by paragraph (f)(3);

1910.1030(h)(1)(ii)(D) The employer's copy of the healthcare professional's written opinion as required by paragraph (f)(5); and

1910.1030(h)(1)(ii)(E) A copy of the information provided to the healthcare professional as required by paragraphs (f)(4)(ii)(B)(C) and (D).

1910.1030(h)(1)(iii) Confidentiality. The employer shall ensure that employee medical records required by paragraph (h)(1) are:

1910.1030(h)(1)(iii)(A) Kept confidential; and

1910.1030(h)(1)(iii)(B) Not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

1910.1030(h)(1)(iv) The employer shall maintain the records required by paragraph (h) for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.1020.

1910.1030(h)(2) Training Records.

1910.1030(h)(2)(i) Training records shall include the following information:

1910.1030(h)(2)(i)(A) The dates of the training sessions;

1910.1030(h)(2)(i)(B) The contents or a summary of the training sessions;

1910.1030(h)(2)(i)(C) The names and qualifications of persons conducting the training; and

1910.1030(h)(2)(i)(D) The names and job titles of all persons attending the training sessions.

1910.1030(h)(2)(ii) Training records shall be maintained for 3 years from the date on which the training occurred.

1910.1030(h)(3) Availability.

1910.1030(h)(3)(i) The employer shall ensure that all records required to be maintained by this section shall be made available upon request to the Assistant Secretary and the Director for examination and copying.

1910.1030(h)(3)(ii) Employee training records required by this paragraph shall be provided upon request for examination and copying to employees, to employee representatives, to the Director, and to the Assistant Secretary.

1910.1030(h)(3)(iii) Employee medical records required by this paragraph shall be provided upon request for examination and copying to the subject employee, to anyone having written consent of

the subject employee, to the Director, and to the Assistant Secretary in accordance with 29 CFR 1910.1020.

1910.1030(h)(4) Transfer of Records.

1910.1030(h)(4)(i) The employer shall comply with the requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

1910.1030(h)(4)(ii) If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the Director, at least three months prior to their disposal and transmit them to the Director, if required by the Director to do so, within that three month period.

1910.1030(h)(5) Sharps injury log.

1910.1030(h)(5)(i) The employer shall establish and maintain a sharps injury log for the recording of percutaneous injuries from contaminated sharps. The information in the sharps injury log shall be recorded and maintained in such manner as to protect the confidentiality of the injured employee. The sharps injury log shall contain, at a minimum:

1910.1030(h)(5)(i)(A) The type and brand of device involved in the incident,

1910.1030(h)(5)(i)(B) The department or work area where the exposure incident occurred, and

1910.1030(h)(5)(i)(C) An explanation of how the incident occurred.

1910.1030(h)(5)(ii) The requirement to establish and maintain a sharps injury log shall apply to any employer who is required to maintain a log of occupational injuries and illnesses under 29 CFR 1904.

1910.1030(h)(5)(iii) The sharps injury log shall be maintained for the period required by 29 CFR 1904.6.

1910.1030(i) Dates—

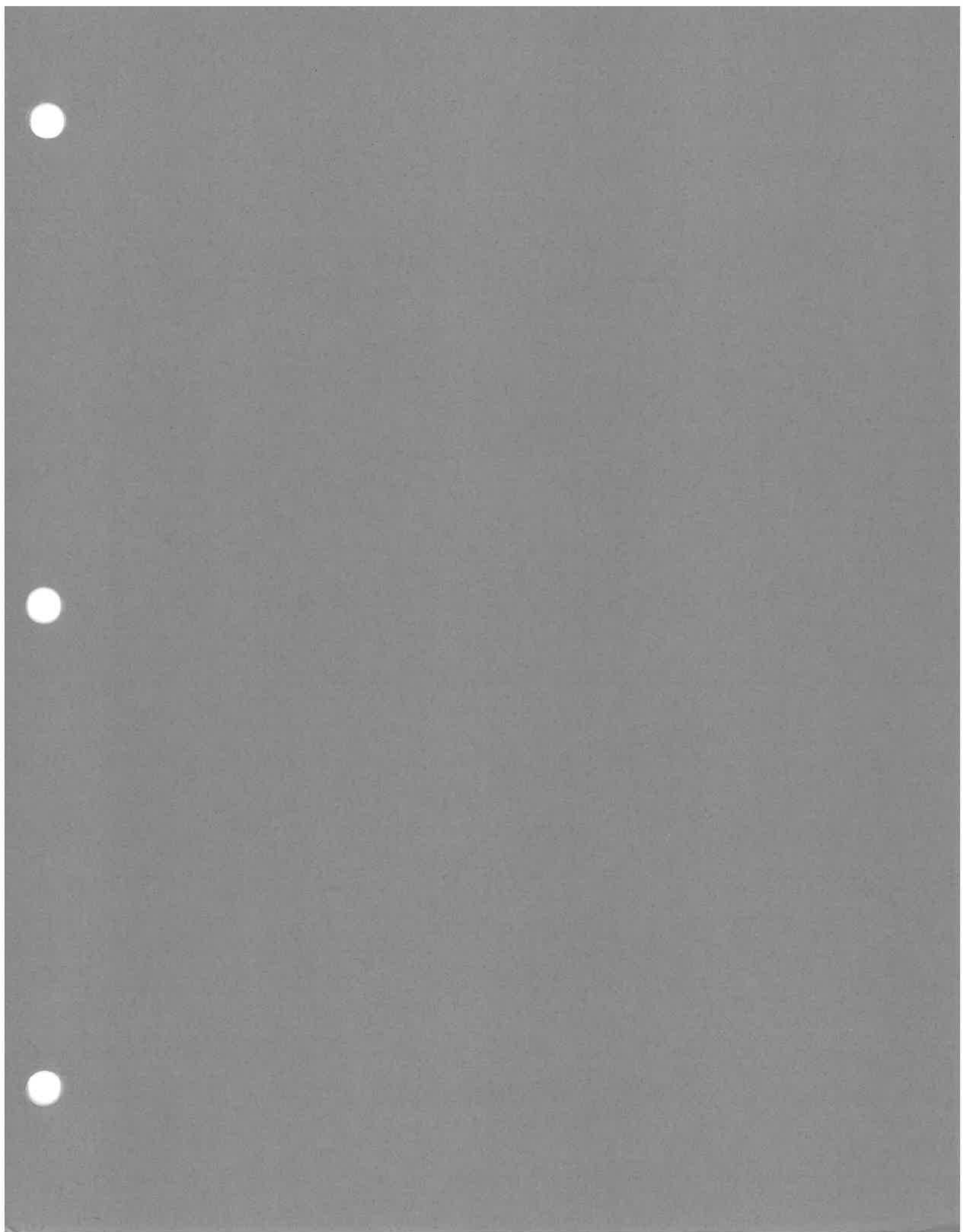
1910.1030(i)(1) Effective Date. The standard shall become effective on March 6, 1992.

1910.1030(i)(2) The Exposure Control Plan required by paragraph (c) of this section shall be completed on or before May 5, 1992.

1910.1030(i)(3) Paragraph (g)(2) Information and Training and (h) Recordkeeping shall take effect on or before June 4, 1992.

1910.1030(i)(4) Paragraphs (d)(2) Engineering and Work Practice Controls, (d)(3) Personal Protective Equipment, (d)(4) Housekeeping, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, and (g)(1) Labels and Signs, shall take effect July 6, 1992.

[56 FR 64004, Dec. 06, 1991, as amended at 57 FR 12717, April 13, 1992; 57 FR 29206, July 1, 1992; 61 FR 5507, Feb. 13, 1996; 66 FR 5325 Jan., 18, 2001; 71 FR 16672 and 16673, April 3, 2006]







Model 35X Series PROFlexx®

August 2013 GLO
Pub. No. 234-3346-02



*Read this Manual
and Retain for
Future Reference*

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Telephone (Toll-free)	1.800.733.3766 ext. 1010
Telephone	1.937.382.1451 ext. 1010
Email	quality.products@ferno.com

Ferno Customer Relations

For ordering assistance or general information:

CANADA AND THE U.S.A.

Telephone (Toll-free)	1.877.733.0911
Telephone	1.937.382.1451
Fax (Toll-free)	1.888.388.1349
Fax	1.937.382.1191
Internet	www.ferno.com

ALL OTHER LOCATIONS

For assistance or information, please contact your Ferno distributor. If you do not have a Ferno distributor, please contact Ferno Customer Relations:

Ferno-Washington, Inc., 70 Weil Way
Wilmington, Ohio 45177-9371, U.S.A.

Telephone	+1.937.382.1451
Fax	+1.937.382.6569
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Disclaimer

This manual contains general instructions for the use, operation and care of this product. The instructions are not all-inclusive. Safe and proper use of this product is solely at the discretion of the user. Safety information is included as a service to the user. All other safety measures taken by the user should be within and under consideration of applicable regulations. It is recommended that training on the proper use of this product be provided before using this product in an actual situation.

Retain this manual for future reference. Include it with the product in the event of transfer to new users. Additional free copies are available upon request from Customer Relations.

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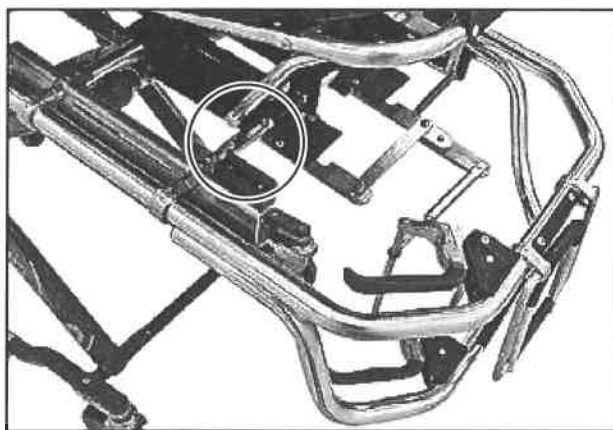
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Serial Number _____

Location: Crosstube Under Shock Frame.



Ferno-Washington, Inc.
70 Weil Way
Wilmington, Ohio 45177-9371 U.S.A.

EC

REP

Ferno (UK) Limited
Stubs Beck Lane, Cleckheaton
West Yorkshire BD19 4TZ, United Kingdom


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1 - SAFETY INFORMATION

1.1 Warning

Warning notices indicate a potentially hazardous situation which, if not avoided, could result in injury or death.

 WARNING
Untrained operators can cause injury or be injured. Permit only trained personnel to operate the cot.
Improper use of the cot can cause injury. Use the cot only for the purpose described in this manual.
Attaching improper items to the cot can cause injury. Use only Ferno-approved items on the cot.
Failure to use the safety hook can cause injury. Install and use the safety hook as described in this manual.
Improper operation can cause injury. Operate the cot only as described in this manual.
An unattended patient can be injured. Stay with the patient at all times.
An unrestrained patient can fall off the cot and be injured. Use restraints to secure the patient on the cot.
False locking can cause injury. After changing positions, lift the cot until all the wheels are off the ground. This allows the lock to engage if it has not already done so.
Rolling the cot sideways or in a loading position can cause it to tip and injure the patient or operators. Roll the cot only in a level (rolling) position and with the head-end or foot-end first.
Helpers can cause injury or be injured. Maintain control of the cot, operate the controls, and direct all helpers.
Improper bariatric transport can cause injury to the patient, operators and helpers. Follow local protocols and the instructions in this manual.
Heavy loads can cause injury. Use as many additional operators and helpers as needed to safely transport the patient.
Using a raised position for bariatric transport can cause injury and cot failure. Keep the cot folded when exceeding the Standard Load Limit.
Improperly unloading a cot during bariatric transport can cause injury. Station one operator or helper in the ambulance to release the cot from the safety hook or safety stop.
Improper maintenance can cause injury. Maintain the cot only as described in this manual.
Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the cot.
Modifying the cot can cause injury and damage. Use the cot only as designed by Ferno.

1.2 Important

Important notices emphasize important usage or maintenance information.

Important

1.3 Bloodborne Disease Notice

To reduce the risk of exposure to bloodborne diseases such as HIV-1 and hepatitis when using the cot, follow the disinfecting and cleaning instructions in this manual.

1.4 Cot and Fastener Compatibility

Combining different manufacturers' products into a "mixed-component" cot/cot fastener system can increase the user's risk of injury and damage.

Ferno-Washington, Inc. strongly recommends that only Ferno-manufactured cots be used in Ferno-manufactured cot fasteners, and that only Ferno-manufactured cot fasteners be used for securing Ferno-manufactured cots in ambulances.

ANY COMBINATION OF A FERNO COT OR COT FASTENER WITH A NON-FERNO COT OR COT FASTENER IS MISUSE OF THE FERNO PRODUCT. Responsibility for the outcome of known, intentional misuse rests squarely on the misuser.

1.5 Safety and Instruction Labels

Safety and instruction labels place important information from the users' manual on the cot.

- The general information label shown at right is affixed to the foot-end frame. It provides general safety, load limit, and use information.
- The hand-guard label shown below reminds the user not to remove the hand guard.

Read and follow label instructions. Replace worn or damaged labels immediately. New labels are available from EMSAR (page 32) or from your distributor.



1.6 Symbol Glossary

The symbols defined below are used on the cot and in this users' manual. Ferno uses symbols recognized by the International Standards Organization (ISO), American National Standards Institute (ANSI) and the emergency medical services industry.



General Warning of
Potential Injury



Read the Users'
Manual



Cot Operation Requires
Two Trained Operators



Standard Load Limit
Use Cot Normally



Cot meets European
Union Standards



Do Not
Lubricate



Lubricate



Unlocked Locked



Bariatric Load Limit
Use Cot in Folded
Position Only

2 - OPERATOR SKILLS AND TRAINING

2.1 Skills

Operators using the cot need:

- a working knowledge of emergency patient-handling procedures.
- the ability to assist the patient.

2.2 Training

Operator trainees need to:

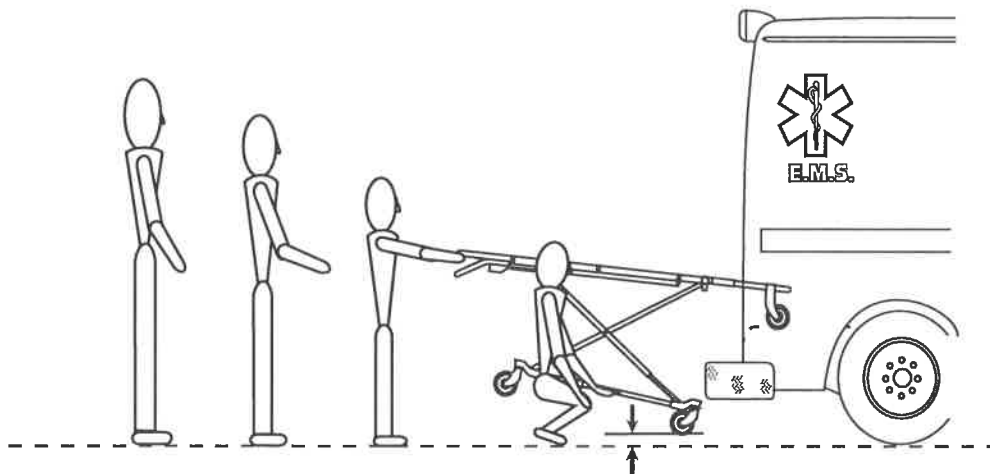
- read and understand this manual.
- be trained on the use of the cot.
- practice with the cot before using it with a patient.
- record their training information. A sample training record sheet is provided on page 35.



WARNING

**Untrained operators can cause injury or be injured.
Permit only trained personnel to operate the cot.**

2.3 Height and Strength Considerations



When unloading the cot, the foot-end operator must lift and hold the weight of the cot, patient and equipment high enough for the wheels to remain off the ground until the undercarriage legs completely unfold and lock into place.

Supporting this weight requires greater strength from short operators than from tall operators because short operators must raise their arms higher in relation to their shoulders.

Be aware that if the ambulance is parked on an uneven surface, the foot-end operator (and any helpers) may need to lift the cot higher than normal to allow the legs to unfold completely and lock.

Bariatric transport requires special operating procedures. See *Bariatric Transport*, pages 26-28.

Note: Use additional help as needed to lift the weight of the cot, patient and equipment (see *Using Additional Help*, page 25).

3 - ABOUT THE COT

3.1 Description

The Ferno® PROFlexx® Model 35X Series Cot (called the cot in this manual) is an emergency patient-handling device designed to transport a patient in a ground-based ambulance. The cot is for professional use by a minimum of two trained operators. It is designed for roll-in loading to help reduce the risk of back injury to medical service personnel.

The cot is designed for use with Ferno® cot fasteners (not included).

COT OPTIONS

- **PROFlexx® 35X:** Standard cot for use with Ferno® Model 175 (antler and rail) fastening system.
- **PROFlexx® 35X-ST:** Cot is compatible with Ferno® Stat Trac® cot fastener system.
- **Accessories:** Your cot may have been shipped with factory-installed accessories per your order; accessories are also available separately.

INCLUDED WITH PURCHASE

- Mattress (1 of 4 styles. See “Customer Choice” Build Options on this page).
- Set of 3 restraints
- Users’ manual
- Training CD-ROM
- Safety Hook (*not required or included with 35X-ST*)

U.S.A. NOTICE

The cot is for use with ambulances that meet the requirements of the “Star of Life” certification via Federal Ambulance Specification KKK-A-1822. For information, contact:

Federal Supply Services, Specifications Section
Suite 8100
470 E. L’Enfant Plaza, SW
Washington, DC 20407



WARNING

Improper use of the cot can cause injury. Use the cot only for the purpose described in this manual.

STANDARD FEATURES

All cots are built with the following features:

- **Clear Anodized handling surfaces** (helps keep hands and clothing clean)
- **High-visibility control handles** (red)
- **9 Height positions**
 - 3 loading positions for vehicle floors 28"-33"
- **EZ-Pull control handles** at cot foot end (control handle may be activated before lifting weight of cot)
- **Shock Frame** (2-position)
- **Drop Frame** (5 positions with 4 locking positions)
- **Backrest** (pneumatic, infinite-positioning 0°-65°)
- **6" Swivel Transport Wheels** (4; 2 w/wheel locks)
- **Telescoping Lift Handles** (2)
- **Restraints** (set of 3)
- **Head-end Leg Protectors**
- **Lower-Frame Scuff Strips**
- **Folding Lead Handle**

“CUSTOMER CHOICE” BUILD OPTIONS

One each of the following options is standard equipment on your cot:

- **Color** (your choice of 5 colors)
- **Cot-Fastener Compatibility**
 - Ferno® Model 175 Antler-and-Rail
 - Ferno® Model 185 Stat Trac®
- **High-Reflectivity Labels**
 - Standard high-reflectivity labels
 - Personalized high-reflectivity labels
- **Sidearms**
 - Ferno® Universal (swing- and fold-down) sidearms
 - Ferno® swing-down sidearms
- **Mattress Options***
 - Mattress with locking hooks
 - Mattress with locking hooks and pocket
 - Mattress with locking hooks, pocket, transfer board
 - Mattress with hook-and-loop fastener

** Mattresses are also available as accessories and as replacement parts.*

3.2 General Specifications

Height¹

Bed Position 9	40 in./102 cm
Loading Position 3	35 in./89 cm
Bed Position 8	39 in./98 cm
Loading Position 2	31 in./79 cm
Bed Position 7	37 in./93 cm
Loading Position 1	27 in./69 cm
Bed Position 6	34 in./87 cm
Bed Position 5	31 in./79 cm
Bed Position 4	28 in./71 cm
Bed Position 3	24 in./62 cm
Bed Position 2	20 in./51 cm
Bed Position 1 (folded)	14 in./35 cm

Length

Maximum	79 in./201 cm
Minimum	64 in./162 cm
Width (Overall)	24 in./61 cm
Weight²	92 lb/42 kg
Weight (ST)²	100 lb/45 kg
Strength to Weight Ratio³	7.6 SWR
Strength to Weight Ratio (ST)³	7.0 SWR
Load Limit	700 lb/317 kg
Bariatric Load Limit⁴	1,100 lb/500 kg

General specifications are rounded to the nearest whole number. Metric conversions are calculated before rounding the Imperial measurements. For more information, contact Ferno Customer Relations (page 2) or your Ferno distributor.

Ferno reserves the right to change specifications without notice.

¹Height measurements are as follows: Loading Position is the distance from the ground to the bottom of the loading wheel. Bed Position is the distance from the ground to the patient surface at the telescoping handle.

²Weight is without mattress, restraints and optional features.

³Strength to Weight Ratio is the load limit of the cot divided by the cot's weight.

⁴Bariatric transport requires special operating procedures. See pages 26-28.



**STANDARD LOAD LIMIT
(ALL COT POSITIONS)**



**BARIATRIC LOAD LIMIT
(FOLDED POSITION ONLY)**

Follow bariatric transport procedures (pages 26-28) when working with loads in excess of the Standard Load Limit. Inspect the cot if the Standard Load Limit has been exceeded (see *Inspecting the Cot*, page 30).

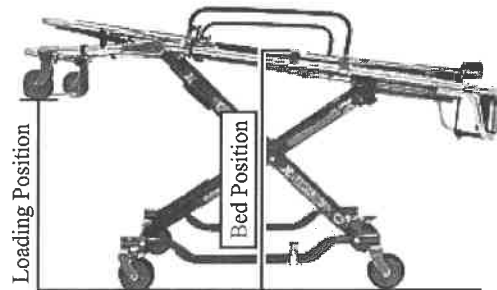
3.3 Cot Positions

Important

Not all users require the highest (9th) Bed/Loading Position. By default, this Bed Position is locked out by a metal plate that limits the cot to Positions 1-8. If your ambulance has a very high loading height that requires the 9th Bed Position, see *Accessing the 9th Bed Position*, page 31.

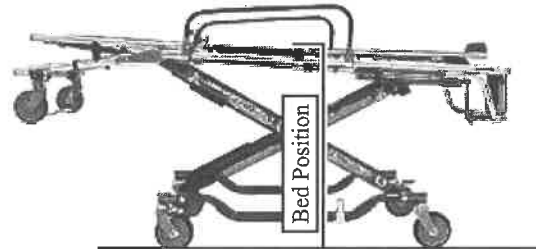
LOADING POSITIONS (3)

The loading position is for use only when loading the cot into, or unloading the cot from, an ambulance. Use the lowest loading position that allows the cot to roll into your ambulance.



ROLLING/TRANSFER POSITIONS (5)

Use a level position to roll the cot and for transferring the patient to or from the cot and an adjacent surface.



FOLDED POSITION

Use the folded position to transfer the patient, to roll the cot during bariatric transport, or to store the cot.



4 - SETUP AND INSTALLATION

4.1 Ambulance Requirements

The ambulance bumper extension should not exceed 14 inches (35.5 cm). The patient compartment should have a level floor large enough for the folded cot, and a Ferno® cot fastener installed (not included). See *Cot and Fastener Compatibility*, page 4.

Important

Loose items and debris on the patient compartment floor can interfere with the operation of the cot with the fastener. Keep the patient compartment floor clear.

4.2 Restraints, Mattress and Accessories

Before placing the cot in service, assign appropriate personnel to install the mattress, restraints, and any accessories shipped with the cot. Keep restraint and accessory users' manuals with this manual for future reference. For additional, free manuals, contact Ferno Customer Relations (page 2).

For complete list of accessories, see *Accessories*, page 34.



WARNING

Attaching improper items to the cot can cause injury. Use only Ferno-approved items on the cot.

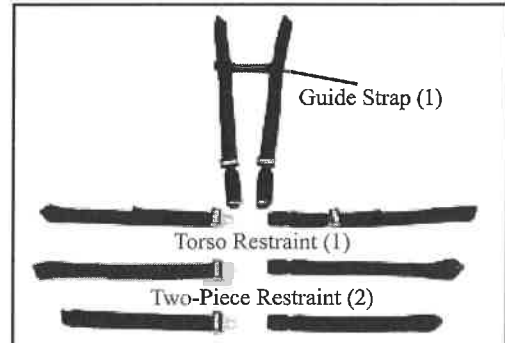


Figure 1 - Restraints (Set of 3)

4.3 Fastener Compatibility

Read the cot fastener users' manual for instructions on using the fastener (see *Cot and Fastener Compatibility*, page 4).

ANTLER-AND-RAIL FASTENERS

Model 35X series cots are compatible with all versions of the Ferno® Model 175 antler and rail cot fasteners. The cot fastener must be configured for use with the Ferno® Model 35 Series - see the fastener installation manual for details.

Using the Model 175 cot fastener requires the installation of the safety hook (included).

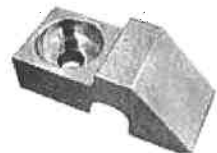
STAT TRAC FASTENERS

Model 35X-ST Series cots are compatible with all versions of the Ferno® Model 185 Stat Trac® fastener. The center of the fastener must be a minimum of 17" (43 cm) from the ambulance wall. If the fastener was installed closer than this minimum distance, it must be reinstalled further from the wall to provide room for the cot wheels to swivel during loading and unloading.

Important

A "sloped" (or low-profile) mounting block (shown here) must be used when the antler portion of the cot fastener is **removable** (installed with large turn-knobs for easy removal).

If your **removable** fastener does not already have this mounting block, contact Ferno Customer Relations, page 2.



This block is **not** used with fasteners permanently-mounted to the floor with a large bolt.

Important

Stat Trac fasteners installed before June 1, 2000 required only 16" (41 cm) of clearance from the ambulance wall to the center of the Stat Trac.

The 6-inch wheels on PROFlexx® Series cots require the fastener to be positioned at least 17" (43 cm) from the wall to allow room for the wheels to swivel as the cot is removed.

If you installed a Stat Trac at the old minimum, you must reposition your Stat Trac to at least the new 17-inch minimum. Contact Ferno Customer Relations (page 2) for a revised Stat Trac installation manual.

4.4 Install the Safety Hook

Note: If your ambulance service uses *only* the Stat Trac® Fastening System, skip the rest of Section 4.

The safety hook (Figure 2) provided with the cot is a component of Ferno's Model 175 Cot Fastening System, and must be installed and used as described in this manual.

The safety hook catches the cot safety bar (Figure 3) to ensure that the cot remains secured inside the ambulance while the operators raise or lower the undercarriage during loading or unloading.

Installing the safety hook requires the skills of a mechanic familiar with ambulance construction.

Before installing the safety hook, consult the ambulance manufacturer regarding:

- the location of wiring, oxygen or fuel lines, and other elements under the ambulance floor.
- the ambulance warranty.

HARDWARE REQUIRED (NOT SUPPLIED)

2	1/4-20 Socket-head cap screws*
2	Flat washers
2	Lock washers
2	1/4-20 Nuts

*The socket-head cap screws must be long enough to pass through the safety hook, patient compartment floor, both washers, **and** still have at least two full threads extending past the nut. The hardware should be of at least SAE Grade 5 with UNC-2 threading (or equivalent).

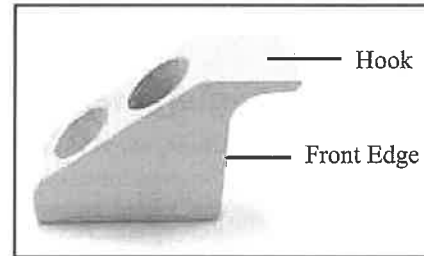


Figure 2 - Safety Hook



WARNING

Failure to use the safety hook can cause injury. Install and use the safety hook as described in this manual.

Important

Before installing the safety hook, consult the ambulance manufacturer about possible interference with wiring and other elements under the ambulance floor, and about the ambulance warranty.

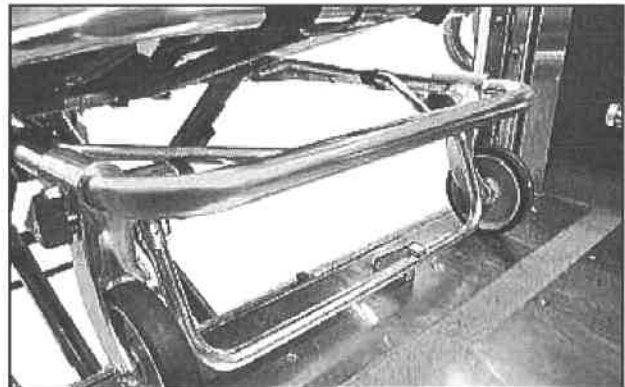


Figure 3 - Engaging the Safety Hook

PROPER SAFETY HOOK PLACEMENT

Position the safety hook aligned with the center of the fastener and as close to the rear of the ambulance as possible, within the limits below:

- The bumper or extended folding bumper must not exceed 14 inches (356 mm).
- Position the safety hook with the hook facing the front of the ambulance.
- Position the safety hook at least 11 inches (279 mm) from both sides of the door frame (Figure 4) so the cot's safety bar will engage the hook when the cot is loaded or unloaded.
- Position the safety hook no more than 19-3/4 inches (451 mm) from the front edge of the hook to the rear of the ambulance, **including** the bumper and folding bumper step in the extended (open) position.

Important

If the safety hook is installed too far inside the ambulance, you will not be able to properly fold or unfold the cot undercarriage when it is secured by the hook. Measure and install the safety hook as instructed in this manual.

INSTALLING THE SAFETY HOOK

1. Mark the position of the safety hook on the floor.
2. Drill holes for the socket-head cap screws and attach the safety hook to the floor (Figure 5).
3. To test the hook, load and unload the cot. Verify that there is no interference with folding or unfolding the legs.

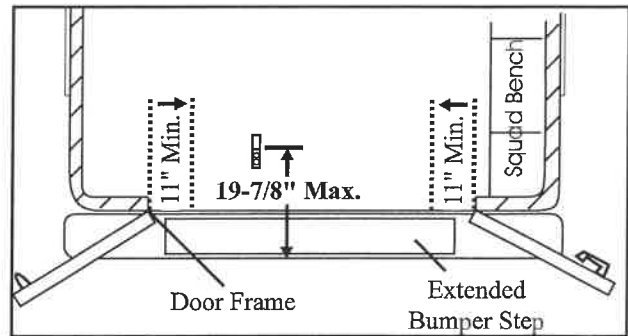


Figure 4 - Safety Hook Placement

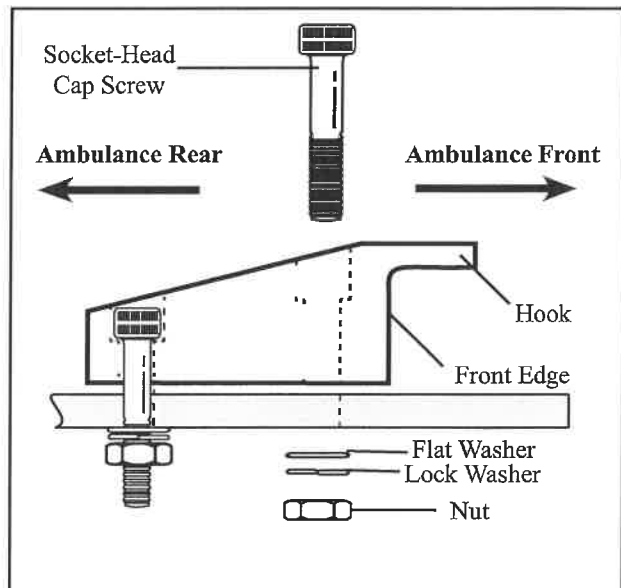


Figure 5 - Installing the Safety Hook

5 - COT FEATURES

5.1 Control Handles

- **Purpose:** An operator uses one of the undercarriage control handles to unlock the locking mechanism that allows the cot to be raised and lowered.
- **Location:** There are three control handles: an upper and a lower handle at the cot foot end, and a side control handle at the patient's right side (Figures 6 and 7).
 - To lift the cot evenly, the two trained operators must stand opposite one another. If using the upper or lower foot-end control handle, position the assisting operator at the cot head end. If using the side control handle, position the assisting operator at the opposite side of the cot.
- **Use:** Any one of the handles may be used to disengage the undercarriage lock.
 - Use the control handle that is best for the lifting situation. For example, the lower control handle gives a short operator better leverage for lifting.

UNDERSTANDING HOW THE

FOOT-END CONTROL HANDLES FUNCTION

Two styles of **foot-end** control handles have been produced. Practice with your cot before placing it in service so you will understand how your cot operates. The two styles require different procedures for using the cot.

- **THE EZ-PULL STYLE** control handle (serial numbers 09N-122459 and higher) requires less force to pull; also, the control handle may be pulled first, before the operators raise or lower the cot.
- **THE LIFT-FIRST STYLE** control handle (unmodified cots with serial numbers below 09N-122459) requires the operators to **lift the weight of the cot and patient off the locking mechanism BEFORE** pulling the control handle. An update kit is available to change from the Lift-First Style to the EZ-Pull Style handle.

Note: The side lifting handle is a Lift-First style handle.

Important

Cots with serial numbers **below 09N-122459** may be updated to the EZ-Pull style. **Do not assume** which style of control handles a cot is equipped with. Practice with the cot before using it in service.

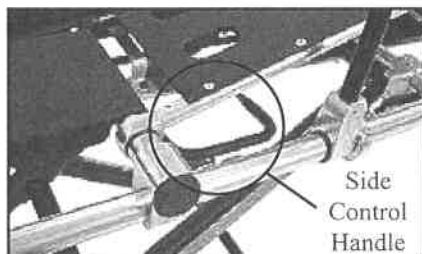


Figure 7 - Side Control Handle

Important

Two styles of foot-end control handle have been produced. Understand how your cot functions **and** practice using the cot without a patient before placing the cot in service.

**Lift-First Style
(Closed Handle)**



**EZ-Pull Style
(Open Handle)**

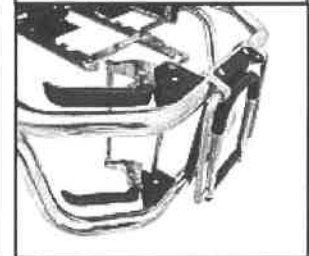


Figure 6 - Control Handle Versions

Using the EZ-Pull Handle

1. Pull the control handle first, before lifting the cot. This allows you to grasp the cot with both hands and lift evenly, without having to open your palm to operate the handle after you assume the load.
2. In a motion coordinated with the head-end operator and any helpers, assume the load by raising the cot to take the weight off the locking mechanism.
3. Once the operators have assumed the load, the mechanism will automatically disengage and the cot can be raised or lowered to the desired height.
4. Release the handle when the cot is near the desired height, then raise or lower the cot until the lock engages. **Before relaxing your grip on the cot main frame, verify that the cot has locked at the new position.**

Using the Lift-First Handle

1. In a movement coordinated with the head-end operator and any helpers, lift the cot to take the weight off the locking mechanism.
2. Open your left hand and pull the control handle to unlock the cot's locking mechanism.
3. Raise or lower the cot to the desired height.
4. Release the handle when the cot is near the desired height, then raise or lower the cot until the lock engages. **Before relaxing your grip on the cot main frame, verify that the cot has locked at the new position.**

5.2 Fastener Release Controls

- **Purpose:** The fastener release control lever (Model 35X) or fastener release control handle (Model 35X-ST) allows the cot to be released from the cot fastener during unloading the cot from an ambulance.
- **Location:** The lever or handle is located near the cot's loading wheels.
- **Use:** To release the cot from the cot fastener:
 - **35X:** Release the cot from the safety hook by turning the lever counter-clockwise (Figure 8).
 - **35X-ST:** Release the cot from the safety stop by squeezing the handle (Figure 9).

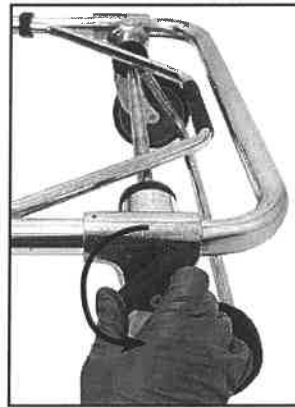


Figure 8 - 35X Lever

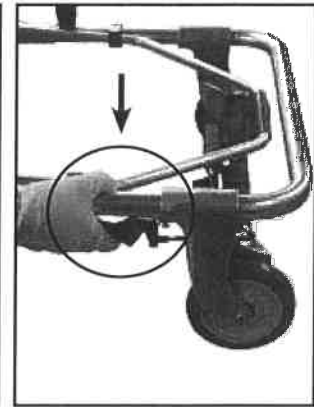


Figure 9 - 35X-ST Handle

5.3 Drop Frame

- **Purpose:** The 5-position drop frame has many uses (Figure 10).
 - **+2 (LOCKED):** The +2 position shortens the cot for use when space is limited. This position is also used to push the cot when it is being used as a bariatric sled (See *Rolling the Cot as a Sled*, page 21 and *Bariatric Transport*, pages 26-28).
 - **+1 (LOCKED):** The +1 position provides a good ergonomic lifting angle for raising or lowering the cot when the cot is at a low level.
 - **EXTENDED (LOCKED):** the extended position is used by an operator for raising or lowering the cot. This position is also used for loading the cot into an ambulance or unloading it from an ambulance. A safety bar (Model 35X) or head-end loading post (Model 35X-ST) attached to the drop frame secures the cot to a safety hook or safety stop inside the ambulance during the loading or unloading process.
 - **-1 (LOCKED):** The -1 position provides a good ergonomic lifting angle for raising or lowering the cot when the cot is at a high level.
 - **-2 (UNLOCKED):** The -2 position is used to shorten the cot when space is limited. The frame is unlocked and is not usable for lifting when in this position.
- **Use:** Squeeze the release bar (Figure 11) to unlock the drop frame, then raise or lower the drop frame to the new position. Let go of the release bar at the new position.
 - Raise the drop frame to the extended, +1 or +2 position before folding the cot.

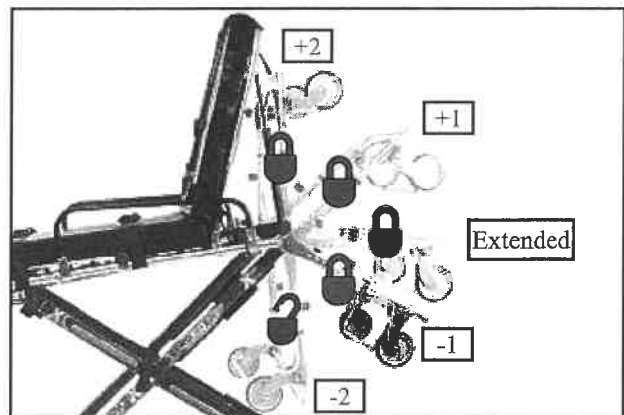


Figure 10 - Drop Frame Positions

Important

Extend or raise the drop frame before folding the cot. Folding the cot with the drop frame in a lowered position can damage the drop frame if it strikes the cot undercarriage, floor, or ground.

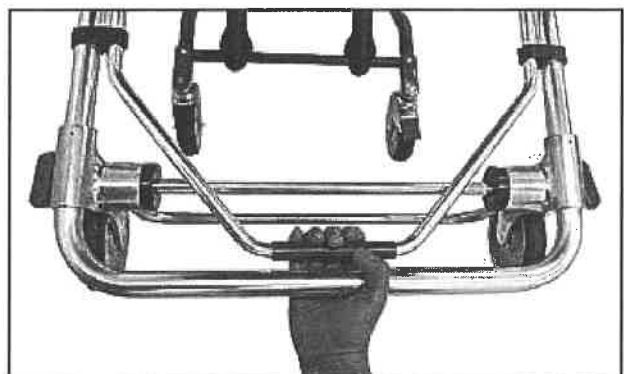


Figure 11 - Drop Frame Release Bar

5.4 Backrest

- **Purpose:** The backrest allows the operator to elevate the patient's torso for patient comfort or medical necessity.
- **Before Use:**
 - Loosen or unbuckle the torso restraint.
 - Support the weight of the backrest and patient.
- **Use:** Press the red control handle toward the backrest frame to unlock the backrest (Figure 12), then raise or lower the backrest to the desired position. Release the control handle to lock the backrest at the new position.
 - The gas spring is under pressure to ease raising and lowering. When a heavy patient is on the cot, support the patient's weight before adjusting the backrest. When a light patient is on the cot, control the upward movement of the backrest so it does not move too quickly.
 - The backrest can be adjusted between 0° and 65°.
- **After Use:** Buckle and/or adjust the torso restraint.

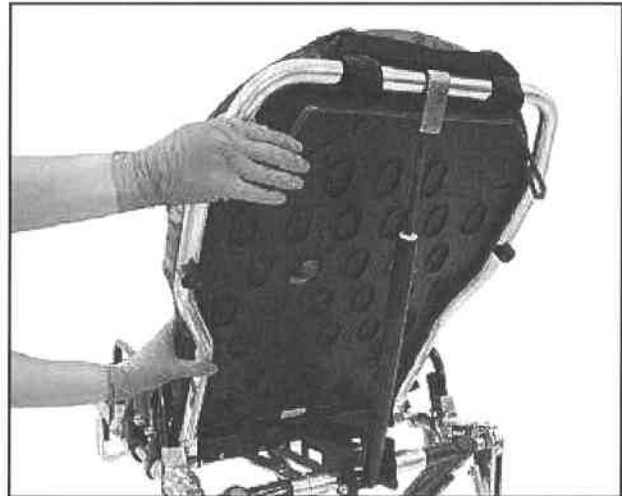


Figure 12 - Using the Backrest

5.5 Shock Frame

- **Purpose:** The shock frame allows the operator to elevate the patient's legs to treat shock or for patient comfort.
- **Use:**
 - **Before use,** loosen or unbuckle the leg restraint.
 - **To raise,** stand at the foot end of the cot. Use both hands to lift the shock frame until it locks in the raised position.
 - **To lower,** stand at the foot end of the cot. Lift the shock frame a little to support the weight, then press the shock frame control levers (Figure 13) and lower the shock frame.
 - **After use,** buckle and/or adjust the leg restraint.

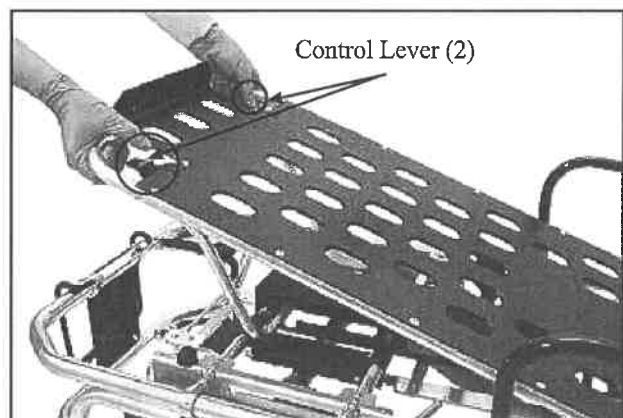


Figure 13 - Lowering the Shock Frame

5.6 Lead Handle

- **Purpose:** The lead handle allows the foot-end operator to pull the cot when it is in a rolling position.
- **Use:** Unfold the lead handle for use (Figure 14); fold it for storage.
 - Do not allow the lead handle to hang unfolded.
 - Use the lead handle only when the cot is on a smooth, level surface. When the cot is on an incline or rough terrain, grasp the main frame of the cot with both hands.



Figure 14 - Using the Lead Handle

5.7 Sidearms: Swing-Down (Standard)

- **Purpose:** Sidearms provide patient security and comfort. Keep the sidearms raised except during patient transfer. The sidearms feature an intermediate stop that allows a patient's arm to be placed on the sidearm for treatment, starting of intravenous (IV) fluids, etc.
- **Use:**
 - **To lower,** squeeze the sidearm release handle (Figure 15) and lower the sidearm. To stop at the intermediate position, let go of the release handle before the sidearm reaches the 90° point. To fully lower the sidearm, continue holding the release handle until the sidearm has passed the 90° point.
 - **To raise,** lift the sidearm until it locks. You do not need to use the release handle.



Figure 15 - Lowering the Sidearm

Important

Do not use the sidearms to lift the cot. Sidearms are not designed for lifting. Lift the cot only by grasping the main frame, or main frame and side lift handles.

Important

Sidearms are designed to support light objects. Do not place objects weighing more than 10 pounds (4.5 kg) on the sidearms.

5.8 Sidearms: Universal (Optional)

- **Purpose:** Sidearms provide patient security and comfort. Keep the sidearms raised except during patient transfer. The sidearms feature an intermediate stop that allows a patient's arm to be placed on the sidearm for treatment, starting of intravenous (IV) fluids, etc.
 - The universal sidearms fold along the cot main frame or swing down like a standard sidearm.
- **Use:**
 - **To fold:** Press the release lever (Figure 16) and fold the sidearm flat along the cot main frame.
 - **To lower:** Press the release lever, pull the sidearm slightly toward the foot end of the cot to free it from the lock, then swing the sidearm down below the cot main frame.
 - **To use the intermediate position:** Press the release lever and begin folding and lowering the sidearm, then slide the sidearm toward the head end of the cot to lock it before lowering to the 90° point.
 - **To raise:** Swing and/or lift the sidearm toward the head end of the cot until it locks.

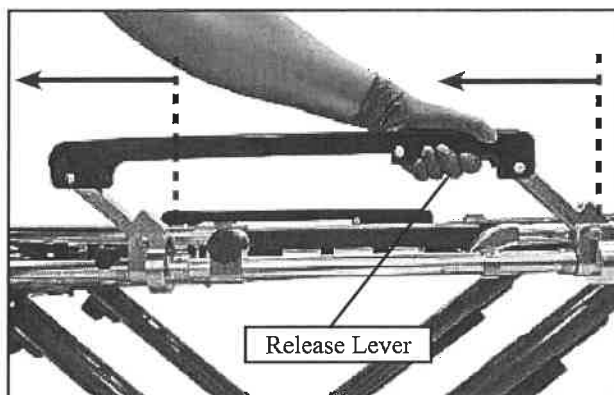


Figure 16 - Using the Universal Sidearm

Important

Do not use the sidearms to lift the cot. Sidearms are not designed for lifting. Lift the cot only by grasping the main frame, or main frame and side lift handles.

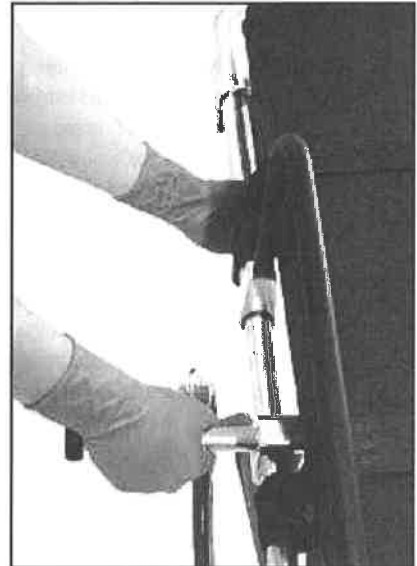
Important

Sidearms are designed to support light objects. Do not place objects weighing more than 10 pounds (4.5 kg) on the sidearms.

5.9 Telescoping Side Lift Handles

- **Purpose:** The telescoping side lift handles can be used as extra lifting or grasping points by operators or additional helpers.
- **Location:** The lift handles are located near the center of the cot.
- **Use:** Pull to extend the lift handle, push to retract.
 - Retract the lift handles when using the side control handle to raise or lower the cot.
 - Figure 17 shows one option for hand placement for lifting the cot. Alternately, grasp the lift handle with both hands.
 - Balance the cot by placing one operator or helper on each side of the cot; lift together, using both lift handles.

Figure 17 - Hand Placement for Using the Lift Handles



5.10 Wheel Locks

- **Purpose:** The wheel locks help keep the cot stationary during patient transfer and certain medical procedures. When engaged, the wheel lock stops wheel rotation and caster swiveling.
- **Location:** Wheel locks are located at opposite corners of the cot where they are accessible to the operator's right foot.
- **Use:** Press the lock lever to engage; tap the top part of the lock lever to disengage (Figure 18).
 - Wheel locks are not brakes. Stay with the cot and maintain control of it at all times. Do not leave the cot or patient unattended.

Figure 18 - Wheel Lock



5.11 Mattress

- **Purpose:** The mattress provides comfort for the patient.
- **Mattress Options (4):** Mattress with 5 plastic hooks; mattress with hooks and transfer-board pocket; mattress with hooks, transfer-board pocket, and transfer board; mattress with hook-and-loop fastening strips.
- **Use:** The bottom of the mattress has either 5 plastic hooks or hook-and-loop fastening strips. The hooks or hook-and-loop strips help hold the mattress in place when transferring a patient onto or off from the cot.
 - **To Attach:** Raise the backrest and/or shock frame as needed and either feed each hook through a hole in the bed surface (Figure 19) OR press the hook-and-loop surfaces together.
 - **To remove:** Slide one hand under the mattress and apply upward pressure, then remove each hook from the bed surface with your other hand OR separate the hook-and-loop fastening strips.

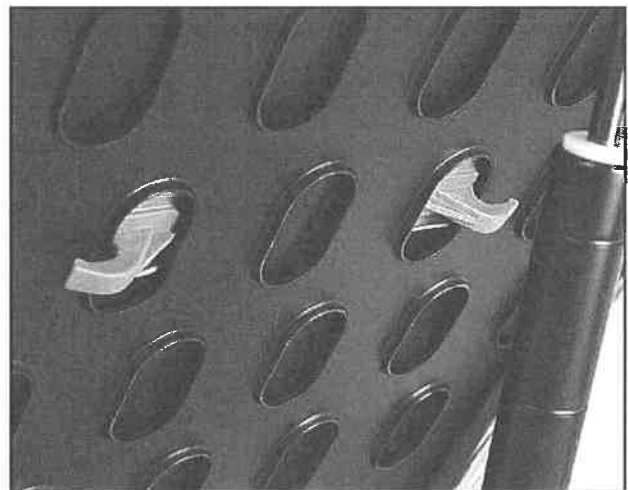


Figure 19 - Mattress Hooks Through Bed Surface

6 - USING THE COT

6.1 Before Placing the Cot in Service

- Personnel who will work with the cot need to read this manual.
- Set up the cot, following the instructions in *Setup and Installation*, pages 9-11.
- Confirm that the cot operates properly. See *Inspecting the Cot*, page 30.
- The vehicle must have a Ferno cot-fastening system installed.



Read the Users'
Manual



Two Trained
Operators Required

6.2 General Guidelines for Use

- Medical advice is beyond the parameters of this manual.
- It is the users' responsibility to ensure safe practices for the patient and themselves.
- A minimum of two trained operators is required.
- Follow standard emergency patient-handling procedures when operating the cot.
- Stay with the patient at all times.
- Always use patient restraints to secure the patient on the cot.
- **Operators work together and maintain control of the cot at all times.**
- Operators communicate with one another and use coordinated movements to operate the cot.
- Lift only the weight you can safely handle. Use additional help when working with heavy loads (patient and equipment). For placement of helpers, see *Using Additional Help*, page 25.
- Keep the cot folded when the load exceeds the Standard Load Limit (see *Bariatric Transport*, pages 26-28). Inspect the cot if the Standard Load Limit has been exceeded (see *Inspecting the Cot*, page 30).



**STANDARD LOAD LIMIT
(ALL COT POSITIONS)**



**BARIATRIC LOAD LIMIT
(FOLDED POSITION ONLY)**



WARNING

Improper operation can cause injury. Operate the cot only as described in this manual.



WARNING

An unattended patient can be injured. Stay with the patient at all times.



WARNING

An unrestrained patient can fall off the cot and be injured. Use restraints to secure the patient on the cot.

6.3 Fully Engaging the Locking Mechanism

False locking is a condition in which the locking mechanism does not fully engage when a control handle is released. This can occur after changing cot positions if the locking pin rests exactly on the tip of a ratchet bar tooth, and can allow the cot to lower to the next locking position when moved.

To ensure the locking mechanism fully engages after changing positions, lift the cot until all the wheels are off the ground. This allows the lock to fully engage if it has not already done so.



WARNING

False locking can cause injury. After changing positions, lift the cot until all the wheels are off the ground. This allows the lock to engage if it has not already done so.

6.4 Changing Cot Positions

Changing cot positions with a patient on the cot requires a minimum of two trained operators working together.

PREPARING TO RAISE OR LOWER THE COT

Operators do the following:

- Stand at opposite ends or sides of the cot (Figures 20-22).
- Select the lifting position that provides the best leverage (Figures 20 or 21).
- Use an underhand grip to grasp the cot main frame.
- **Control Operator only:** Position your hand to use the control handle.
- Choose the appropriate set of steps below.

Important

- With the EZ-Pull Handle, you may pull the control handle first, then lift the cot (See page 12).
- With the Lift-First Handle, you must lift the cot **before** you pull the control handle (See page 12).

EZ-PULL-STYLE CONTROL HANDLE

1. **Control Operator:** Pull the control handle.
2. **Both Operators:** Lift the cot high enough for the weight to be removed from the locking mechanism so the locking mechanism will disengage.
3. **Both Operators:** Both operators raise or lower the cot.
4. **Control Operator:** Release the control handle when the cot is near the desired height.
5. **Both Operators:** Together, lift the cot until all four transport wheels are off the ground. This ensures the undercarriage lock engages if it has not already done so.
6. **Both Operators:** Set the cot onto the floor or ground. Do not release your grasp until you are sure the undercarriage is locked at the new position.

LIFT-FIRST-STYLE CONTROL HANDLE

1. **Both Operators:** Lift the cot slightly to take the weight off the locking mechanism.
2. **Both Operators:** As the control operator squeezes and holds the control handle, both operators raise or lower the cot. If the control handle is difficult to squeeze, both operators lift the cot a little higher to free the locking mechanism.
3. **Control Operator:** Release the control handle when the cot is near the desired height.
4. **Both Operators:** Together, lift the cot until all four transport wheels are off the ground. This ensures the undercarriage lock engages if it has not already done so.
5. **Both Operators:** Set the cot onto the floor or ground. Do not release your grasp until you are sure the undercarriage is locked at the new position.

Important

Operators should expect and be prepared to control the normal downward movement of the cot that occurs when a control handle is squeezed.



Figure 20- Upper Lifting Positions



Figure 21 - Lower Lifting Positions



Figure 22 -
Changing
Positions from
the Side

Raising or Lowering the Cot in Two Stages

To maintain proper lifting techniques, the operators may choose to adjust the cot height in two stages (Figure 23).

To do this:

1. Use one set of lifting positions to raise or lower the cot partway.
2. Stop at a comfortable position and verify that the undercarriage is locked.
3. Adjust your hands to new lifting positions:
 - **Assisting Operator:** Raise or lower the drop frame to a different locked position.
 - **Control Operator:** Move your hands from the main frame to the lower lift frame or vice-versa.
4. Raise or lower the cot to the desired finishing position.

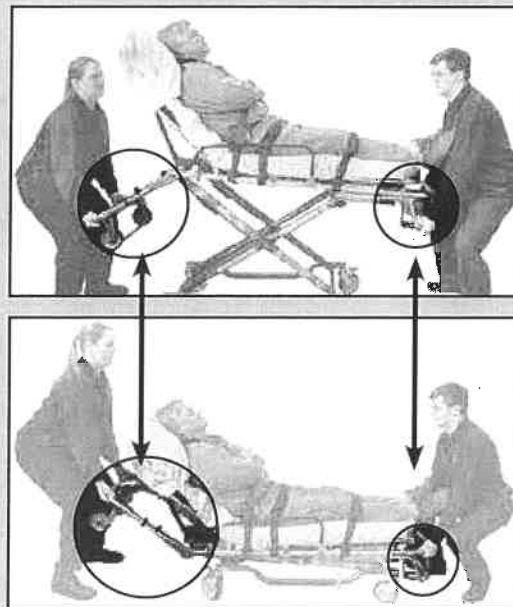


Figure 23 - Two-Stage Position Changes

HOW TO RECOVER FROM IMPROPERLY FOLDING THE COT

If you attempt to fold the cot with the drop frame locked in the lower lifting (-1) position, the drop frame mechanism will bind and cause the cot not to sit level.

If this occurs, do not release the drop frame hinges; you could jar the patient and/or damage the hinge mechanism. To recover, both operators raise the cot into a higher position. Adjust the drop frame to the extended position and then fold the cot.

6.5 Transferring the Patient

To transfer a patient onto the cot:

1. Unfasten the restraints and arrange the straps so they will not interfere with transferring the patient onto the cot.
2. Place the cot beside the patient and adjust it to the patient's level.
3. Engage the wheel locks, lower or fold the sidearms, and retract the side lift handles.
4. Transfer the patient onto the cot using approved EMS procedures and your local protocols.
5. Raise the sidearms. Adjust the backrest and shock frame as needed.
6. Fasten and adjust the patient restraints (Figure 24).
7. Release the wheel locks.
8. Before moving the cot or changing its position, verify that sheets and other articles are positioned where they will not interfere with cot operation.



Figure 24 - Securing the Patient

Important

Do not fold the cot with the drop frame locked in the lower lifting position. Place the drop frame in the extended position or higher before folding the cot. Use two-stage lowering if needed (see above).

Important

Sheets or other articles that are placed, or find their way, beneath the metal bed of the cot can become caught in the ratchet mechanism and cause it to malfunction. Take care to tuck sheets between the mattress and the metal bed of the cot. Keep other articles above the mattress.

6.6 Rolling the Cot

GENERAL GUIDELINES

- Rolling the cot with a patient on the cot requires a **minimum of two trained operators working together and maintaining control of the cot at all times.**
- Rolling the cot in a loading position can cause the cot to tip. Always use a rolling position to roll the cot (see *Cot Positions*, page 8).
- Roll the cot on smooth, unobstructed surfaces whenever possible.
- To cross a low obstacle such as a door sill, lift the cot slightly to take the weight off the wheels so the wheels roll smoothly over the obstacle.
- Lift and carry the cot over a high obstacle such as a curb. **Do not** apply downward force on one end of the cot in order to raise the other end of the cot over the obstacle.
- Do not roll the cot sideways. Rolling a cot sideways can increase the chance for the cot to tip and injure the patient and/or operators.
- Use additional help as needed to safely control the weight of the patient and cot (see *Using Additional Help*, page 25).
- When using additional help, trained operators stand at the head and foot ends of the cot and work the controls. Helpers can extend the side lifting handles or grasp the main frame, and assist the trained operators.
- When rolling over rough terrain, the operators (and helpers) should grasp the cot with both hands. Side operators or helpers place both hands on the main frame or lifting handles, or place one hand on each.
- Side helpers may need to walk sideways under some circumstances. Follow local protocols.
- If the load (patient plus equipment) exceeds the cot's Standard Load Limit, use bariatric transport techniques. see *Bariatric Transport*, pages 26-28.

ROLLING THE COT

- Securely fasten the restraints around the patient.
- Both Operators:** Place the cot in a rolling position. See *Cot Positions*, page 8.
- Control Operator:** Position yourself at the foot end of the cot, grasp the main frame, and pull the cot forward. Or, if rolling the cot on a smooth, flat surface, unfold the lead handle and pull the transporter (Figure 25).
- Assisting Operator:** Position yourself at either the head-end of the cot (grasping the drop frame) or at the side of the cot near the patient's torso (grasping the main frame, Figure 25). Attend the patient and assist in rolling and steering the cot.



WARNING

Rolling the cot sideways or in a loading position can cause it to tip and injure the patient or operators. Roll the cot only in a level (rolling) position and with the head-end or foot-end first.

Important

Roll the cot downhill foot-end first. If it is not medically appropriate to do this, roll the cot head-end first, but do the following:

To maintain cot balance while rolling the cot downhill head-end first, the Assisting Operator must exert upward force on the drop frame.

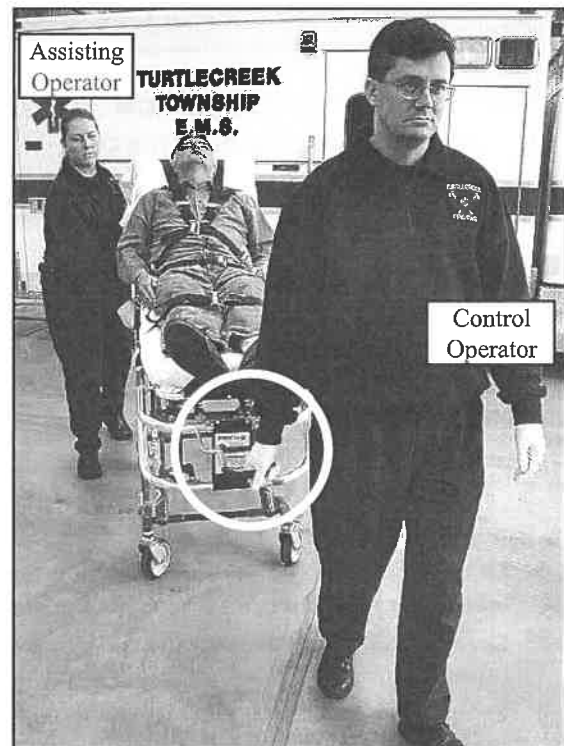


Figure 25 - Rolling the Cot

ROLLING THE COT AS A SLED

The cot's lead handle and drop frame allow the cot to be rolled as a sled. This is the preferred way to roll the cot when the load exceeds the cot's Standard Load Limit. See *Bariatric Transport*, pages 26-28. To roll the cot as a sled:

1. Fold the cot and raise the backrest.
2. **Assisting Operator:** Raise the drop frame to one of the high locking positions (+1 or +2). Grasp the drop frame with both hands and help steer and push the cot (Figure 26).
3. **Control Operator:** Extend the lead handle and pull the cot (Figure 26).

Note: Tall, bariatric push-pull handles that mount to the cot frame are available. See Accessories, page 34 to order accessories.

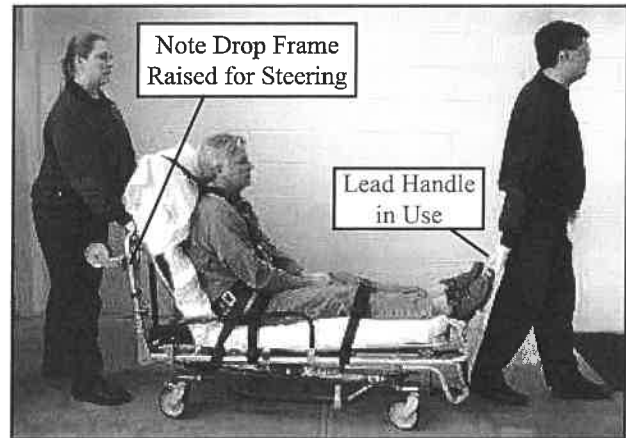


Figure 26 - Rolling the Cot as a Sled

6.7 Preparing to Load the Cot

1. Raise the ambulance folding bumper, if present.
2. Place the cot in a loading position (see *Cot Positions*, page 8).
3. Place the drop frame in the extended position.
4. Roll the cot to the patient compartment door.

Note: Use additional help as needed when working with heavy loads (patient and equipment). See *Using Additional Help*, page 25.

Important

If the ambulance is parked on an uneven surface, the operators (and any helpers) may need to lift the cot higher than normal to allow the undercarriage to lock.

Important

Loose items and debris on the patient compartment floor can interfere with the operation of the cot with the fastener. Keep the patient compartment floor clear.

6.8 Loading the Cot

Loading the cot with a patient on it into an ambulance requires a minimum of two trained operators working together.

1. Roll the cot forward until both loading wheels are on the patient compartment floor and either:
 - the safety bar passes the safety hook (Figure 27)
 - the head-end loading post passes the safety stop on the Stat Trac (Figure 28)

Important

- With the EZ-Pull Handle, you may pull the control handle first, then lift the cot (See page 12).
- With the Lift-First Handle, you must lift the cot **before** you pull the control handle (See page 12).

2. **Control Operator:** Choose the control-handle operation that is correct for your cot's control-handle style. To determine which control handle is on your cot, see *Control Handles*, page 12.
 - **EZ-Pull Handle:** Pull the control handle, then lift the foot end of the cot until it is level with the ambulance floor (Figure 29).
 - **Lift-First Handle:** Lift the foot end of the cot until it is level with the ambulance floor (Figure 29), then pull the control handle.
3. **Control Operator:** Tell the Assisting Operator to lift the undercarriage.
4. **Assisting Operator:** Kneel by the side of the cot (Figure 29) and grasp the undercarriage grip. When the Control Operator communicates that he/she is ready, lift the undercarriage all the way up and hold it in the folded position (Figure 30).
5. **Control Operator:** Release the control handle to lock the undercarriage in the folded position. Push the cot into the ambulance.
6. **Assisting Operator:** Assist the Control Operator as necessary. Release your grip on the undercarriage after all of the cot's wheels are inside the ambulance.
7. **Either Operator:** Secure the cot in the cot fastener.

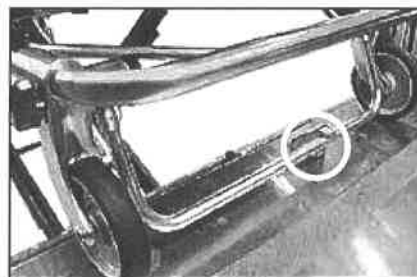


Figure 27 - Safety Bar Past Safety Hook



Figure 28 - Loading Post Past Safety Stop

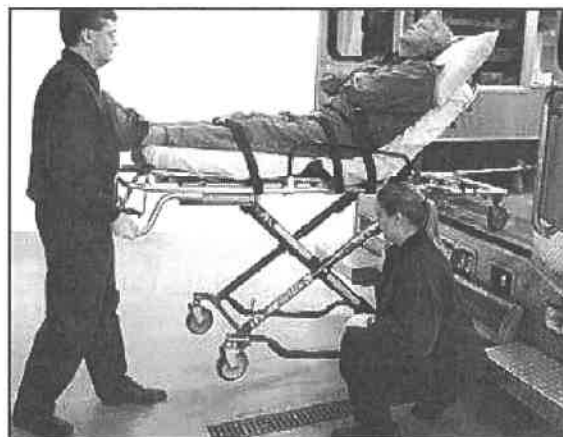


Figure 29 - Lifting the Cot Level

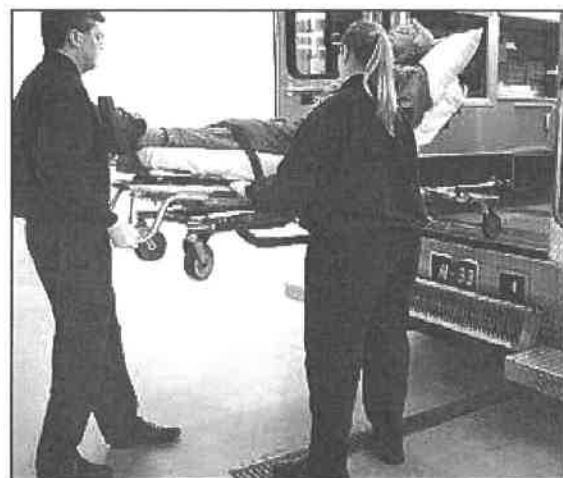


Figure 30 - Folding

6.9 Unloading the Cot

Unloading the cot with a patient on it from an ambulance requires a minimum of two trained operators working together.

1. Raise the folding bumper, if present.
2. Release the cot from the cot fastener.
3. **Control Operator:** Grasp the cot main frame or lower lift frame and squeeze the undercarriage control handle.
4. **Control Operator:** Keeping the foot end raised and level with the ambulance floor, pull the cot slowly from the ambulance (Figure 31) until the cot is stopped by either the safety hook or the safety stop.

Assisting Operator: As the cot is pulled from the ambulance, grasp the undercarriage hand grip on the lower frame (Figure 32) and lower the undercarriage to the ground.

Note: If the undercarriage is not unfolding, the Assisting Operator should lift the undercarriage slightly to take the weight off the locking mechanism.

Important

Verify that the undercarriage is locked before operating the fastener release lever or release handle. An unlocked undercarriage will allow the cot to fold.

5. **Control Operator:** Release the control handle.
6. **Control Operator:** Lift the cot until all four transport wheels are off the ground to make sure the undercarriage has unfolded completely and is locked. Set the cot on the ground.
7. **Assisting Operator:** Use the fastener release lever or handle to disengage the cot from the safety hook or safety stop (Figures 32 or 33).
8. **Both Operators:** Roll the cot completely out of the ambulance. As the cot is rolled away from the safety hook or safety stop, the Assisting Operator lets go of the fastener release lever or handle.
9. **Both Operators:** Place the cot in a rolling position (see *Cot Positions*, page 8).



Figure 31 - Unloading the Cot

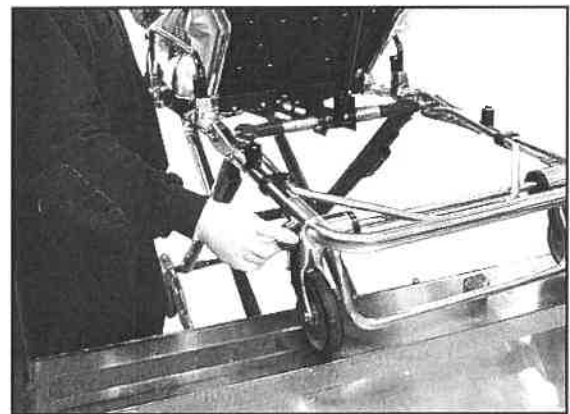


Figure 32 - Disengaging the Release Lever (Model 35X)

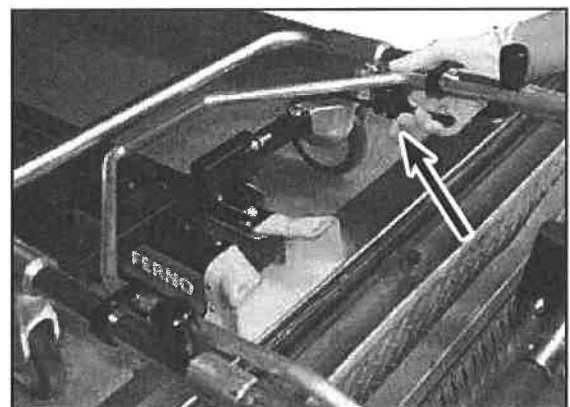


Figure 33 - Disengaging the Release Handle (Model 35X-ST)

6.10 One Operator, Empty Cot

CHANGING POSITIONS

If local protocols permit, **and** only when the cot is empty (no patient), one trained operator can change the cot position. Tip the empty cot onto its loading wheels (Figure 34), operate the control handle and raise or lower the cot to the desired position. Then, let go of the control handle and return the cot to its transport wheels.

ONE OPERATOR LOADING

An empty Model 35X (Model 175-compatible) cot may be loaded into and unloaded from the ambulance by one trained operator.

Do not load or unload a Model 35X-ST (Stat Trac-compatible cot) with one operator as this can damage the cot and/or the fastener. Always use two operators to load and unload the 35X-ST cot.

1. Raise the ambulance folding bumper, if present.
2. Place the cot in a loading position and roll the cot into the ambulance until both loading wheels are on the patient compartment floor and the safety bar passes the safety hook.
3. Choose one of the following steps (for control handle information, see *Control Handles*, page 12).
 - **EZ-Pull Handle:** Squeeze and hold the control handle, lift the cot until the wheels are off the ground, then lower the foot end of the transporter to the ground (Figure 35).
 - **Lift-First Handle:** Lift the cot until the wheels are off the ground, then squeeze and hold the control handle and lower the foot end of the transporter to the ground (Figure 35).
4. Release the control handle to allow the undercarriage to lock.
5. Grasp the undercarriage frame with one hand and pull upward on the undercarriage to make sure the cot has locked in the folded position (Figure 36).
6. Lift the foot end of the cot until it is level with the patient compartment floor (Figure 37). Push the cot into the ambulance.
7. Secure the cot in the cot fastener.

ONE OPERATOR UNLOADING

1. Raise the ambulance folding bumper and release the cot from the cot fastener.
2. Begin pulling the cot from the ambulance but do not operate the control handle. Continue pulling until the safety hook catches the safety bar.
3. Lower the cot foot end to the ground.
4. Squeeze the undercarriage control handle and raise the foot end until the cot wheels are off the ground and the undercarriage unfolds completely and locks.
5. Release the control handle and set the cot on the ground.
6. Disengage the safety bar from the safety hook.

Important

- With the EZ-Pull Handle, you may pull the control handle first, then lift the cot (See page 12).
- With the Lift-First Handle, you must lift the cot **before** you pull the control handle (See page 12).

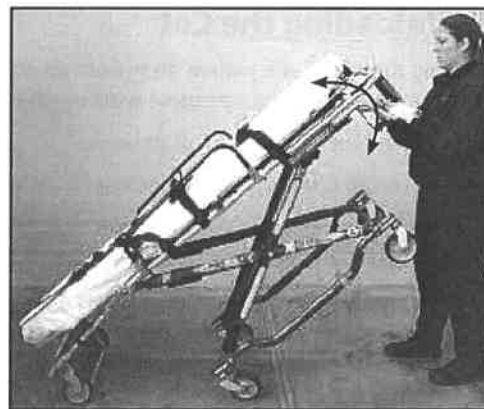


Figure 34 - Changing Positions: One Operator

Important

Do not load or unload a Stat Trac-compatible cot with one operator as this can damage the cot or cot fastener.

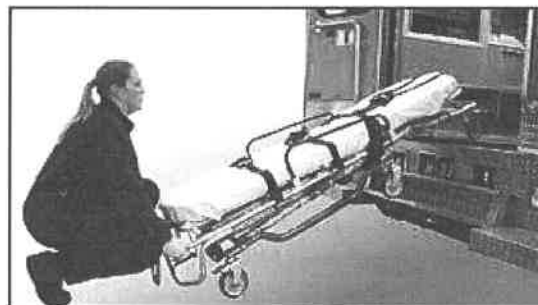


Figure 35 - One Operator Loading



Figure 36 - Check Undercarriage Lock

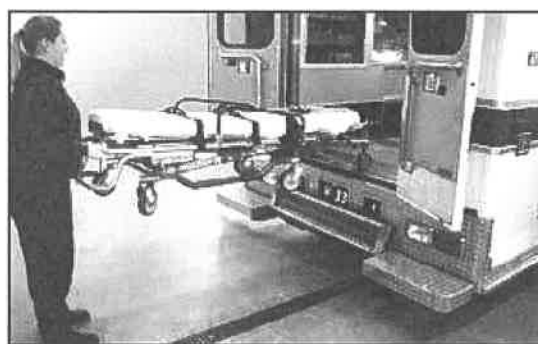


Figure 37 - Lifting the Cot Level

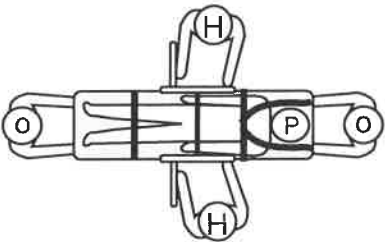
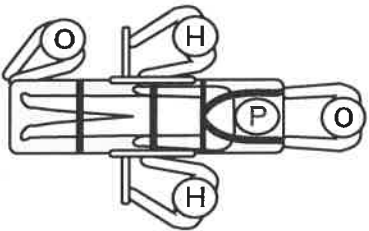
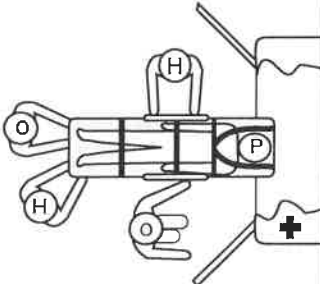
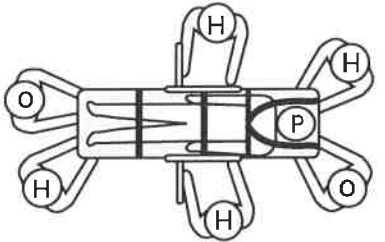
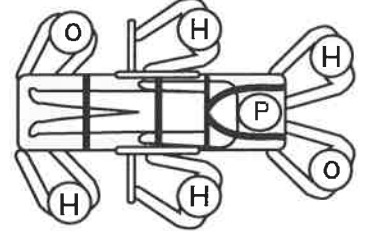
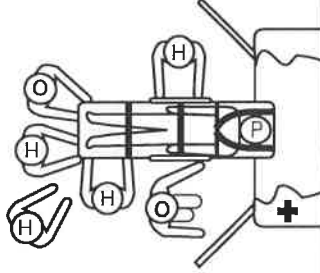
6.11 Using Additional Help

Operating the cot requires a minimum of two trained operators. They may need additional help when working with heavy loads (patient plus equipment).

- Operators stand at the head and foot ends of the cot, maintain control of the cot, operate the controls, and direct all helpers.

- Side helpers may need to walk sideways under some circumstances. Follow local protocols.
- Ferno recommends that helpers work in pairs to help maintain cot balance.

The chart below shows suggested placement for operators and helpers.

Helpers	Changing Levels	Rolling	Loading/Unloading
Two Operators + Two Helpers			
Two Operators + Four Helpers			

Key: O = Operator H = Helper P = Patient



WARNING

Helpers can cause injury or be injured. Maintain control of the cot, operate the controls, and direct all helpers.

Important

Trained operators position themselves at the head and foot ends of the cot and operate the controls. Show helpers where to stand and how to grasp the cot.



**STANDARD LOAD LIMIT
(ALL COT POSITIONS)**



**BARIATRIC LOAD LIMIT
(FOLDED POSITION ONLY)**

Follow bariatric transport procedures (pages 26-28) when working with loads in excess of the Standard Load Limit. Inspect the cot if the Standard Load Limit has been exceeded (see *Inspecting the Cot*, page 30).

7 - BARIATRIC TRANSPORT

7.1 Bariatric Transport Definition

Bariatrics is the branch of medicine dealing with extreme obesity. Ferno defines Bariatric Transport as using the cot when the Standard Load Limit has been exceeded.

The Standard Load Limit of the cot is 700 pounds (318 kg). This is the load limit for all normal cot functions including raising and lowering, loading and unloading an ambulance, and rolling.

When special techniques are used, the cot can be used with loads up to 1,100 pounds (500 kg). This is the Bariatric Load Limit.

Remember that the “load” on the cot equals the patient’s weight plus the weight of any attached accessories and other equipment being carried on the cot.

OPTIONAL EQUIPMENT (NOT REQUIRED)

- Additional patient restraints, restraint extenders, and/or longer patient restraints are recommended.
- The Ferno® Large Body Surface (LBS™) and LBS Jr. bariatric board accessories provide a wider bed surface for an extremely large patient. Patient restraint extenders are included with purchase.

Note: *The LBS™ and LBS Jr. accessories require a center-mounted cot fastener.*

- Manta™ Rescue Aid is a large vinyl sheet with multiple handholds to aid in moving a large patient.
- Bariatric push-pull handles are available to help steer the cot when it is being rolled in the folded position.

7.2 Bariatric Transport Guidelines

When undertaking a bariatric transport:

- Follow your local protocols for bariatric transport.
- Use as many additional operators and helpers as needed to safely transport the patient. See *Using Additional Help*, page 25 for recommended placement of additional helpers.
- Follow the instructions in this section.
- Keep the cot in the folded position when the load exceeds 700 pounds (318 kg).
- Properly restrain the patient as instructed in this manual, the restraint users’ manuals, and the LBS™ or LBS Jr. users’ manual. As needed, use additional restraints, restraint extenders, and/or longer restraints. Use only Ferno-approved restraints and accessories. See *Accessories*, page 34.



WARNING

Improper bariatric transport can cause injury to the patient, operators and helpers. Follow local protocols and the instructions in this manual.



WARNING

Heavy loads can cause injury. Use as many additional operators and helpers as needed to safely transport the patient.



**STANDARD LOAD LIMIT
(ALL COT POSITIONS)**



**BARIATRIC LOAD LIMIT
(FOLDED POSITION ONLY)**

Follow bariatric transport procedures when working with loads in excess of the Standard Load Limit. Inspect the cot if the Standard Load Limit has been exceeded (see *Inspecting the Cot*, page 30).

Important

Exceeding the Standard Load Limit can cause damage to the cot. Immediately inspect the cot and restraints for damage if the Standard Load Limit has been exceeded.

7.3 Bariatric Transport: Transferring the Patient

If the load (patient plus equipment) will exceed the Standard Load Limit of 700 pounds (318 kg), follow the instructions in *Transferring the Patient*, page 19 with the following changes:

- If accessory items are used (restraint extenders, additional restraints, longer restraints, LBS™ or LBS Jr., etc.) attach these items to the cot before transferring the patient onto the cot.
- Place the cot in the folded position before transferring the patient onto the cot (Figure 38).
- Secure the patient onto the folded cot (Figure 39).



Figure 38 - Transferring a Bariatric Patient

7.4 Bariatric Transport: Rolling the Cot

Roll the cot in the folded position when the load exceeds the Standard Load Limit (Figure 40).

If the patient's size and medical condition permit:

- Raise the backrest, then raise the drop frame.
- Use the drop frame to help push and steer the cot (See *Rolling the Cot as a Sled*, page 21).

Do not place the cot in a raised position. Rolling the cot in a raised position when the Standard Load Limit is exceeded can lead to:

- Injury to the patient and/or operators and helpers.
- Cot damage and/or failure.

The operators and helpers must lift and carry the cot over obstacles. Follow your local protocols and use as much additional help as needed.

Note: (Optional) accessory push-pull handles provide an improved ergonomic solution for controlling the cot when it is in the folded position. To order, see Accessories, page 34.



Figure 39 - Securing a Bariatric Patient



Figure 40 - Rolling the Cot with a Bariatric Patient



WARNING

Using a raised position for bariatric transport can cause injury and cot failure. Keep the cot folded when exceeding the Standard Load Limit.

7.5 Bariatric Transport: Loading the Cot

To load the cot into an ambulance when the Standard Load Limit is being exceeded, **do not** use the cot control handles or the safety hook or Stat Trac® safety stop.

1. Roll the cot as close as possible to the ambulance while keeping it in the folded position.
2. Use as many additional operators and helpers as needed to safely pick up the cot and place it in the ambulance.

Do not activate any controls. Leave the cot in the folded position as you pick it up and place it in the ambulance (Figure 41).

Note: If using the Stat Trac® fastener, you must load both of the cot loading posts into the Stat Trac®. Place one person inside the ambulance to watch and verbally direct the operators and helpers to guide the cot into the cot fastener.

3. Secure the cot in the cot fastener.



Figure 41 - Bariatric Loading

7.6 Bariatric Transport: Unloading the Cot

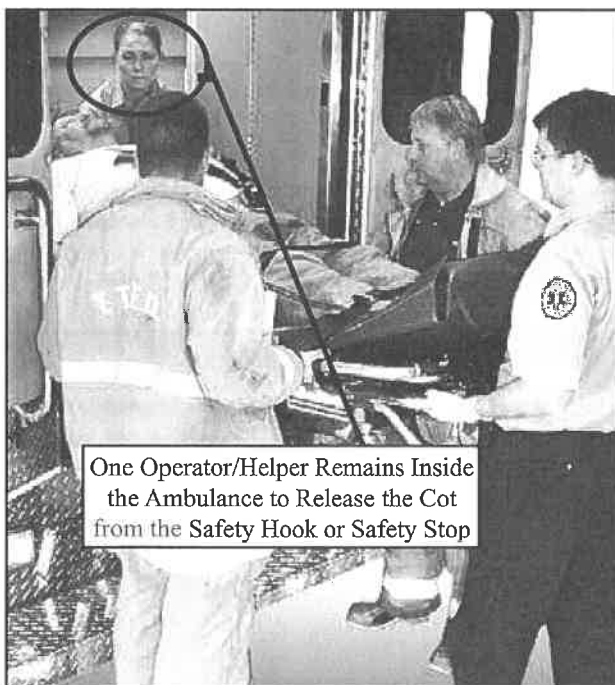
When the Standard Load Limit is being exceeded, **do not** use the cot control handles or the safety hook or Stat Trac® safety stop while unloading the cot from the ambulance.

1. Station one operator or helper inside the ambulance to release the cot from the safety hook (or Stat Trac® safety stop) when needed.
2. **Outside Operators/Helpers:** Release the cot from the cot fastener.
3. **Outside Operators/Helpers:** Roll the cot slowly out of the ambulance (Figure 42), allowing all operators and helpers to grasp the cot main frame (or the LBS™ or LBS Jr. frame).
4. **Inside Operator:** When the safety hook (or Stat Trac® safety stop) catches the cot, use the release lever or handle to release the cot.
5. **Outside Operators/Helpers:** Together, lift the cot out of the ambulance and set it on the ground.
6. **Outside Operators/Helpers:** Roll the cot on the ground as shown in *Bariatric Transport: Rolling the Cot*, page 27.



WARNING

Improperly unloading a cot during bariatric transport can cause injury. Station one operator or helper in the ambulance to release the cot from the safety hook or safety stop.



One Operator/Helper Remains Inside the Ambulance to Release the Cot from the Safety Hook or Safety Stop

Figure 42 - Bariatric Unloading

8 - MAINTENANCE

8.1 Maintenance Schedule

The cot requires regular maintenance. Set up and follow a maintenance schedule. The table at right represents minimum intervals for maintenance.

Keep maintenance records. A sample maintenance record sheet is provided on page 35.

When using maintenance products, follow the manufacturers' directions and read the manufacturers' material safety data sheets. You can purchase a recommended disinfectant from your Ferno distributor or Ferno Customer Relations (page 2).

8.2 Disinfecting and Cleaning the Restraints

Remove the restraints from the cot. Disinfect and clean only as directed in the restraint users' manuals provided with the restraints. Additional, free users' manuals can be obtained from Ferno Customer Relations (page 2).

8.3 Disinfecting and Cleaning the Mattress

1. Remove the mattress from the cot (also remove the transfer board from the mattress, if you have the mattress with pocket).
2. **To disinfect:** Apply disinfectant to the mattress, following the manufacturer's instructions for application method and contact time.
3. **To clean:** Wash the mattress with warm, soapy water and a soft cloth. Rinse the mattress with clear water. Hang the mattress to dry, or dry it with a towel.

8.4 Disinfecting the Cot

Wipe all surfaces with disinfectant. Follow the disinfectant manufacturer's instructions for application method and contact time. Ferno recommends you inspect the cot for damage as you disinfect it.



WARNING

Improper maintenance can cause injury. Maintain the cot only as described in this manual.

Minimum Maintenance Intervals	Each Use	As Needed	Each Month
Disinfecting (this page)	•		
Cleaning (pages 29-30)		•	
Waxing (page 30)		•	
Inspecting (page 30)		•	•
Lubricating (page 31)		•	

Important

Disinfectants and cleaners containing bleach, phenolics, or iodines can cause damage. Use caution when disinfecting and cleaning with products containing these chemicals.

8.5 Cleaning the Cot

1. Remove the restraints, mattress and any accessories.
2. Hand clean all surfaces of the cot with warm water and a mild detergent.
3. Rinse with warm, clear water. Dry the cot with a towel or allow it to air-dry.

8.6 Waxing the Cot

While it is not necessary to wax this cot, waxing the aluminum main frame or the painted legs will not damage them, and will help maintain the cot's appearance.

Disinfect and clean the cot before applying wax. Use an automotive wax as directed by the wax manufacturer.

8.7 Inspecting the Cot

Have your service's equipment maintenance personnel inspect the cot regularly. Follow the checklist at right and operate the cot through all its functions as described in this manual.

If inspection shows damage or excessive wear, remove the cot from service until repair is made. See *Parts and Service*, pages 32 and 33.

Important

Water under high pressure, or steam, can penetrate joints, flush away lubricant, and cause corrosion. Use caution when cleaning moving parts such as joints and hinges, and reapply lubricant if needed (see page 31).

Important

Using abrasive cleaning compounds or applicators on the cot can cause damage. Do not use abrasive materials to clean the cot.

INSPECTION CHECKLIST

- Are all components present?
- Is the cot free of excessive wear?
- Are all screws, nuts, bolts, rivets, and roll pins securely in place?
- Do all moving parts operate smoothly and properly?
- Does the cot lock properly into each position?
- Does the cot load and unload properly?
- **35X only:** Does the safety hook properly engage the safety bar during unloading?
- **35X-ST only:** Does the Stat Trac safety stop properly engage the head-end loading post during unloading?
- Does the cot roll smoothly?
- Do the wheels have some tread?
- Do the wheel locks engage properly and stop wheel rotation?
- Are the restraints properly installed?
- Is restraint webbing in good condition with no cuts or frayed edges?
- Are restraint buckles free of visible damage and do they operate properly?
- Is the ambulance properly prepared for the cot with an approved Ferno® cot fastener installed (and safety hook for Model 35X cots)?
- Do installed accessories operate properly without interfering with cot operation?

8.8 Lubricating the Cot

Disinfect and clean the cot before applying lubricant. Use the lubricants designed below to lubricate the cot. Do not lubricate points marked with the “Do Not Lubricate” symbol.



LUBRICATION POINTS

Use a small amount of lubricant. Lubricate identical points on each side of the cot (Figure 43).

- | | |
|---------------------------|---------------------------------------|
| 1. Drop frame hinge teeth | WRL-191S, E-Z-1, white lithium grease |
| 2. Sidearm lock pins | SAE 30-weight oil (1-2 drops) |
| 3. Ratchet bar mounts | WRL-191S or E-Z-1 (1-2 drops) |

LUBRICATION-FREE POINTS

- | | |
|--------------------------------------|------------------|
| ⊗ Loading wheel bearings | Do not lubricate |
| ⊗ Backrest hinges | Do not lubricate |
| ⊗ Side lift handles | Do not lubricate |
| ⊗ Telescoping legs | Do not lubricate |
| ⊗ Transport wheels (sealed bearings) | Do not lubricate |
| ⊗ Control handle mechanisms | Do not lubricate |

8.9 Accessing the 9th Bed Position

By default, the cot's 9th Bed Position is inaccessible. The 8th Bed Position, with a loading height of around 31 inches (79 cm), is the most commonly-used loading height. However, if your ambulance has a very high floor that requires a higher loading height, the 9th position provides a loading height of 35 inches (89 cm). To access the 9th position, do the following:

1. Use a 1/8" Allen wrench and a 3/8" socket or open-end wrench to remove the two screws from the lockout bar (a large metal plate) that runs between the two ratchet bars (Figure 44).
2. Turn the lockout bar around so that the long end of the metal plate faces the head end of the cot (Figure 45).
3. Reattach the lockout bar.

Note: If your ambulance has an extremely low loading height (for example, some van-based ambulances) an accessory kit is available to make **both** Bed Positions 8 and 9 inaccessible (this makes Position 7 the highest accessible position). If you can load the cot into your ambulance using Position 7, order and install this kit. See Accessories, page 34.

Important

Lubricating parts that should not be lubricated allows dirt and foreign particles to collect on those parts, resulting in damage. Lubricate **only** the numbered reference points shown.

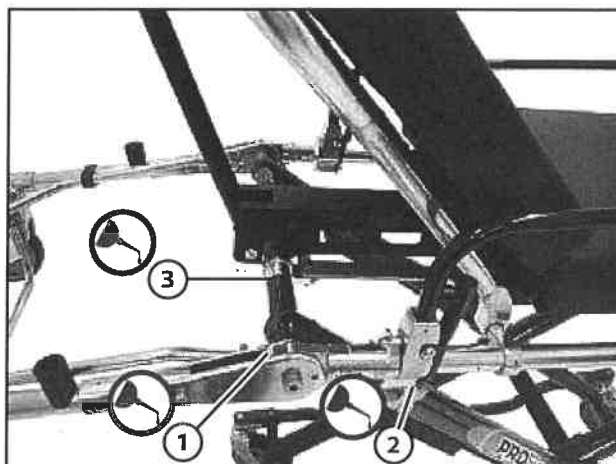


Figure 43 - 35X Series Lubrication Points

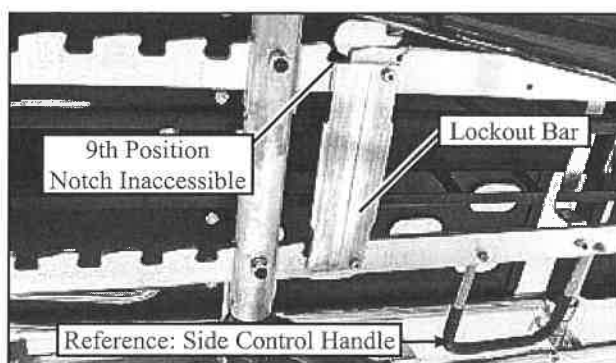


Figure 44 - Lockout Bar with 9th Position Inaccessible (Viewed from Beneath Cot)

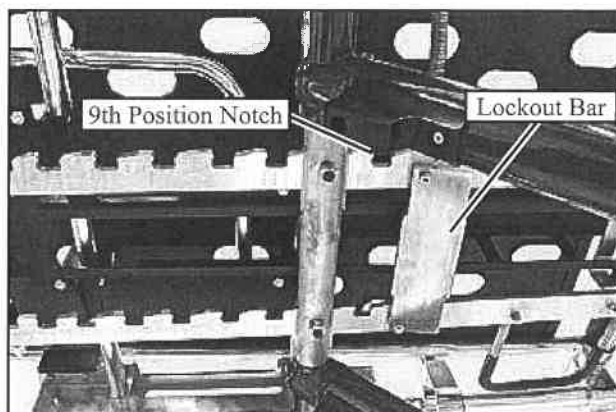


Figure 45 - Lockout Bar Turned to Allow Use of 9th Position (Viewed from Beneath Cot)

9 - PARTS AND SERVICE

9.1 U.S.A. and Canada

In the United States and Canada, to order parts or for professional cot repair, contact EMSAR® - the only agent authorized by Ferno to manage, service, and repair Ferno products.

Telephone (Toll-Free)	1.800.73.EMSAR
Telephone	1.937.383.1052
Fax	+1.937.383.1051
Internet	www.EMSAR.com



WARNING

Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the cot.



WARNING

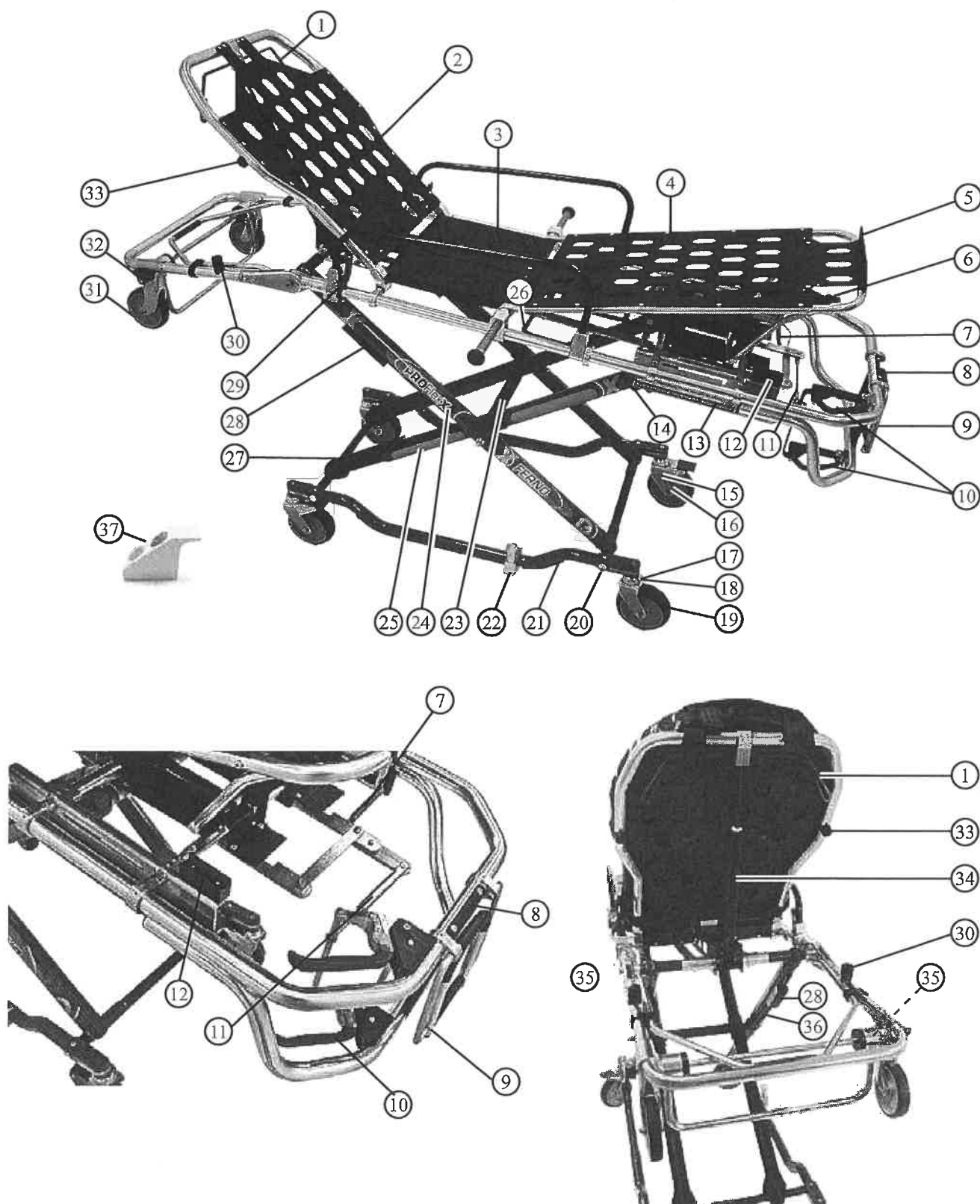
Modifying the cot can cause injury and damage. Use the cot only as designed by Ferno.

9.3 Parts List

No.	Part	Description	Qty
1	190-1357	Gas-assist release handle	1
2	190-1590	Backrest panel w/rivets	1
3	190-1251	Seat panel w/rivets	1
4	190-1246	Shock panel w/rivets	1
5	190-1258	Oxygen bottle mount bracket kit (not shown)	1
6	190-1365	Shock frame thumb release w/hardware	2
7	090-5326	Ratchet bar spring	2
8	190-1591	End panel w/rivets	1
9	190-1605	Lead handle w/E-Clips	1
	190-1732	E-Clips (package)	6
10	190-1592	Lift-First foot-end rel. handle w/hardware	1
	087-0002	EZ-Pull foot-end rel. handle w/hardware	1
11	190-1594	Lift-First rel. handle adjustment linkage	1
	190-1775	EZ-Pull spring cylinder & connect. rod assy.	1
12	190-1610	Shock frame guide w/hardware	2
13	190-1607	Slide cover w/hardware	2
14	190-1598	Foot end clearance block w/hardware	2
15	190-1600	Wheel fork with lock (no wheel)	1
16	190-1602	Caster assembly with lock	1
17	190-1601	Wheel fork (no lock, no wheel)	1
18	190-1603	Caster assembly no lock	1
19	190-1144	6" Wheel w/bearings and hardware	1
20	190-1589	Lower corner push-caps (set of 4)	1

No.	Part	Description	Qty
21	190-1608	Lower frame scuff strip (set)	1
22	190-1240	Fastener post, split	1
23	190-1604	X-frame axle w/cover, hardware	1
24	190-1597	35X logos and clear labels (set)	1
25	190-1599	High-reflectivity labels (set)	1
26	190-1593	Side release handle w/hardware	1
27	090-5795	Replacement leg guard (1 only)	1
28	190-1595	Head-end clearance block w/hardware	2
29	(select below)	Sidearm release handle:	
	082-2153	Pair	1
	082-2154	Patient right side	1
	082-2155	Patient left side	1
30	190-1771	35X Drop frame bumper w/hardware	2
31	190-1243	5" Load wheel w/bushing, hardware	1
32	190-1343	Safety bar release handle w/hardware	1
33	190-1013	Backrest bumper	2
34	190-1588	Gas-assist cylinder w/hardware	1
35	090-5465	Safety bar torsion spring	2
36	190-1609	Non-telescoping leg scuff strip	2
37	090-5015	2.5" Safety hook	1
n/s	190-1596	Tech label sheet	1
n/s	090-5866	O-ring kit for 6" wheels	4
n/s	190-1254	Ratchet bar limit cable	1

9.4 Parts Diagrams



10 - ACCESSORIES

Ferno offers a full line of accessories (cot fasteners, IV poles, immobilizers, blankets, bariatric equipment, etc.) that are approved for use with the cot.

Always follow the instructions packed with accessories. Keep the instructions with this manual. Be aware of any special considerations (loading heights, door width, etc.) when using accessories. Contact Ferno Customer Relations (page 2) or your Ferno distributor to order accessories or for additional information.



WARNING

Attaching improper items to the cot can cause injury. Use only Ferno-approved items on the cot.

Description	Part Number
-------------	-------------

SOFT GOODS

PROFlexx Sof-Net (Drop Frame Storage)	082-1996
Sidearm Cover (Storage Device, 2 ea.)	082-1953
Model 430 Restraint (2 pc., 7' Black)	031-3911
Model 430 Restraint (2 pc., 5' Black)	031-3892
Model 417-1 Torso Restraint w/Shoulder Harness	031-3915
Restraint Guide Strap (only)	031-3945
Mattress w/Locking Hooks	031-3920
Mattress w/Locking Hooks, Transfer Board Pocket	031-4028
Mattress with Hook-and-Loop Fastening Strips	031-4035
Mattress (Folding) for LBS™	031-4025
Mattress (Folding) for LBS Jr.	031-4050

BARIATRIC ACCESSORIES

Bariatric Push-Pull Handle, Angled (1 ea.)	*082-2147
Bariatric Push-Pull Handle, Straight (1 ea.)	*082-2148
Bariatric Tow Package	082-2121
LBS™ (Large Body Surface) Complete w/Mounts	**082-2057
LBS Jr. Bariatric Board Complete w/Mounts	**082-2184
LBS™ Mounting Blocks (set/6)	082-1994
LBS Jr. Mounting Blocks (set/4)	082-2186
Model 132 Manta Rescue Aid (burgundy)	038-2969
1' Restraint Extender (1 ea.)	031-3942
2' Restraint Extender (1 ea.)	031-3659
3' Restraint Extender, Adjustable (1 ea.)	031-3670
Restraint Extender Kit (set/6, various lengths)	0000442

Description	Part Number
-------------	-------------

COT-MOUNTED ACCESSORIES

Lower Storage Tray (Aluminum)	815-9607
Equipment Bracket "Extra Hand"	CA5250
Model 274 Pac Rac® Equipment Tray	081-8933
Model 513-13 IV Pole, Cot-Mounted	008-7172
Model 513-10 IV Pole, Cot-Mounted	008-7156
Model 513-LBS IV Pole (for LBS™/LBS Jr.)	008-7173
Lockout Kit (Locks Out Positions 8-9)	082-2244
Eclipse™ Flashlight Holder	082-2145
Dialysis Kickstand	082-2116
Swing-Out Lift Handle (pair)	082-1998
Oxygen Cylinder Holder (Mounts on Foot End)	081-9958
Oxy-Clip O2 Holder (Mounts on Cot Side Frame)	008-5500
Oxy-Clip2 O2 Holder (Mounts on Drop Frame)	082-1977
Head-End O2 Mount (Mounts on Backrest)	082-2111
X-O2 Mounting System (Mounts Btwn Cot Legs)	CA5320
X-O2 Mounting System w/Flow Control Valve	0000443

TOUCH-UP PAINT

Rescue Red	081-9972
DayGlo Green	081-9973
Safety Orange	081-9974
Electric Blue	081-9975
Black	081-9977

OTHER ACCESSORIES

Transfer Board	010-7992
SaniZene® Hard Surface Cleaner/Disinfectant (4 ea., 1 gal.)	078-9214

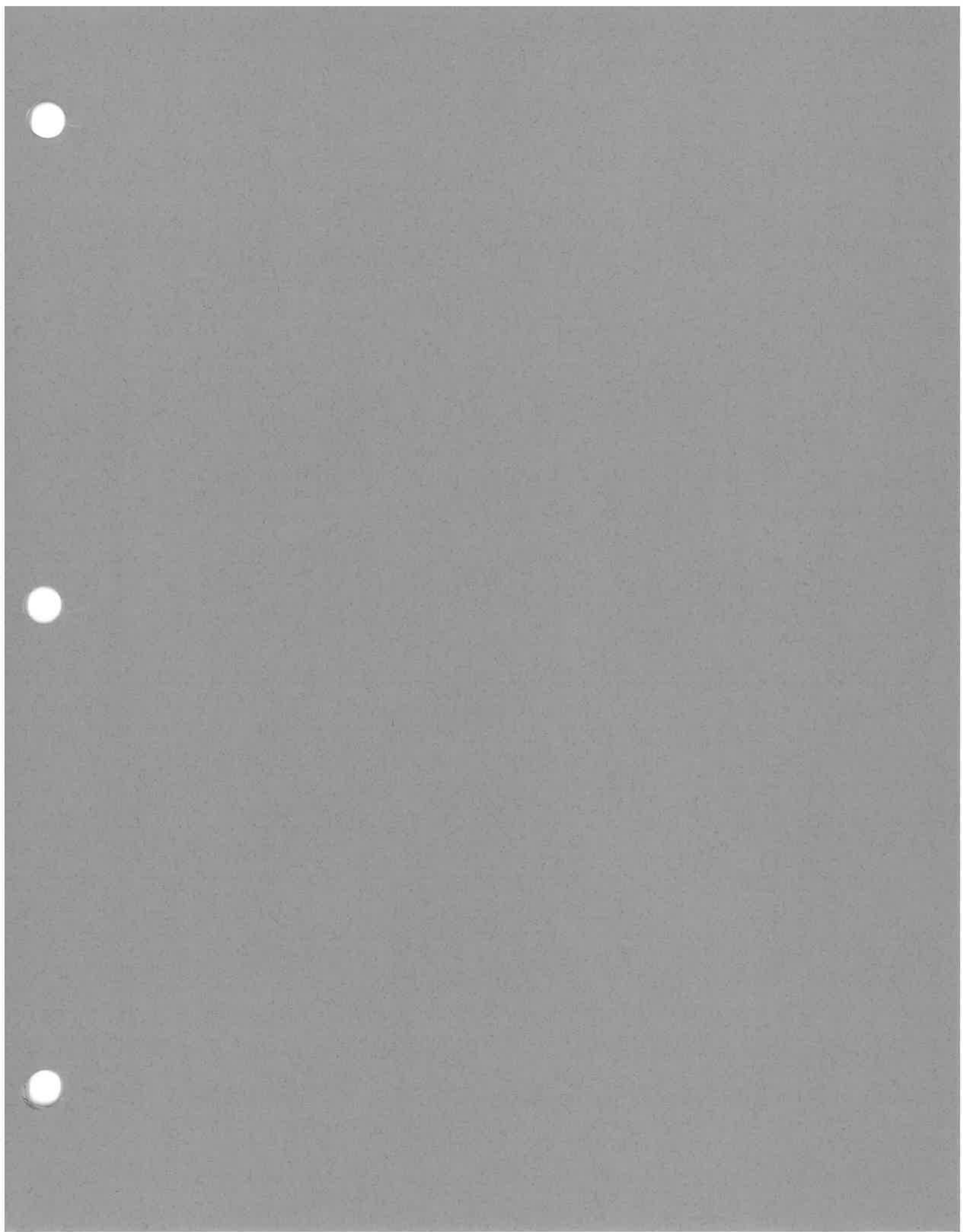
Low-profile mounting block and short knob for use with Removable-Mount Model 175 Cot Fastener	082-2243
--	----------

* Bariatric Push-Pull Handles may be mounted at either the head end or foot end of the cot, or both. To mount a handle at both ends of the cot, order two kits. Note: If desired, kits may be mixed (angled handle at one end and straight handle at opposite end).

** Purchase of an LBS™ or LBS Jr. includes a set of restraint extenders and a Model 132 Manta Rescue Aid.

TRAINING RECORD		
Date	Name	Training Method

MAINTENANCE RECORD		
Date	Maintenance Performed	By







FERNO

When it's critical.™

Users' Manual



MODEL 59-T



MODEL 59

Model 59-T and Model 59 EZ Glide™ Evacuation Chair

October 2005

Pub. No. 234-3298-01

Disclaimer

This manual contains general instructions for the use, operation and care of this chair. The instructions are not all-inclusive. Safe and proper use of this chair is solely at the discretion of the user. Safety information is included as a service to the user. All other safety measures taken by the user should be within and under consideration of applicable regulations. It is recommended that training on the proper use of this chair be provided before using this chair in an actual situation.

Retain this manual for future reference. Include it with the chair in the event of transfer to new users. Additional free copies are available upon request from Customer Relations.

Proprietary Notice

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**Additional Instructional Material Available for the
EZ Glide Evacuation Chair**

EZ Glide Training CD 283-1214

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Ferno-Washington, Inc.
70 Weil Way
Wilmington, OH 45177-9371 U.S.A.

Telephone (Toll Free) 1.877.733.0911
Telephone 1.937.382.1451
Fax (Toll Free) 1.888.388.1349
Fax 1.937.382.6569
Internet www.ferno.com

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1 - SAFETY INFORMATION

1.1 Warnings

Warning notices indicate a potentially hazardous situation which, if not avoided, could result in injury.

WARNING

Untrained operators can cause injury or be injured. Permit only trained personnel to operate the chair.

Improper use of the chair can cause injury. Use the chair only for the purpose described in this manual.

Attaching one-piece restraints improperly can allow seat and back panels to dislodge, resulting in injury. Restraints must capture panels AND chair frame.

Using the chair with the track unlocked can cause injury. Verify that the track is locked before transporting the patient.

Lubricating the track system can result in injury to the patient and/or operators. Never lubricate the track or belts.

Improper operation can cause injury. Operate the chair only as described in this manual.

An unattended patient can be injured. Stay with the patient at all times.

An unrestrained patient can fall off the chair and be injured. Use restraints to secure the patient on the chair.

Helpers can cause injury or be injured. Maintain control of the chair, operate the controls, and direct all helpers.

Improper maintenance can cause injury. Maintain the chair only as described in this manual.

WARNING

Attaching improper items to the chair can cause injury. Use only Ferno-approved items on the chair.

Modifying the chair can cause injury and damage. Use the chair only as designed by Ferno.

Attaching improper items to the chair can cause injury. Use only Ferno-approved items on the chair.

1.2 Important

Important notices emphasize important usage or maintenance information.

Important

The chair lock must be disengaged **before** beginning to fold or unfold the chair. Pull the lock bar forward, **then** begin to fold or unfold the chair.

1.3 Bloodborne Disease Notice

To reduce the risk of exposure to bloodborne diseases such as HIV-1 and hepatitis when using the chair, follow the disinfecting and cleaning instructions in this manual.

1.4 Safety and Instruction Labels

Safety and instruction labels place important information from the users' manual on the chair.

Read and follow label instructions. Replace worn or damaged labels immediately. New labels are available from EMSAR (page 32) or from Ferno Customer Relations (page 34).

The labels illustrated on pages 6 and 7 are affixed to the chairs.

Safety and Instruction Labels (continued)

MODEL 59-T EVACUATION CHAIR LABELS

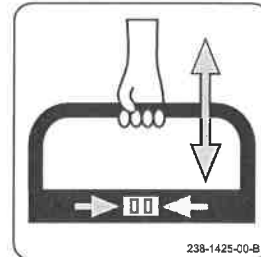
Model 59-T EZ Glide Evacuation Chair

- Minimum of two trained operators required
- Use only as described in users' manual
- Free users' manuals: 1-800-733-3766 or www.ferno.com



Label A

Basic Safety Guidelines and Load Limit



Label B

Instruction for Adjusting Lift Bar Height

Pull then Fold/Unfold Chair

238-1425-00-C

Label C - Instruction for Folding and Unfolding Chair

Do Not Lubricate

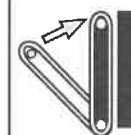


Label D

Safety Instruction:
Do NOT Lubricate
Track System

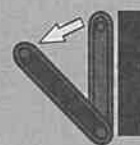
Label F
Instruction for
Closing Track

**Push
to
Close**



238-1425-00-F

Pull to Open



238-1425-00-E

Label E - Instruction for Opening Track

WARNING

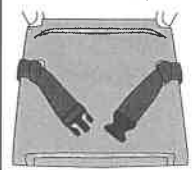
Attaching restraints improperly can allow seat and back panels to dislodge, resulting in injury. Restraints must capture panel AND chair frame as shown.

Free users' manuals:
1.800.733.3766 or www.ferno.com

One-Piece Restraint



Two-Piece Restraint



238-1440-00

Label 234-1440-00
Safety Instruction:

How to Attach
One- and Two-Piece Restraints

Safety and Instruction Labels (continued)

MODEL 59 EVACUATION CHAIR LABELS

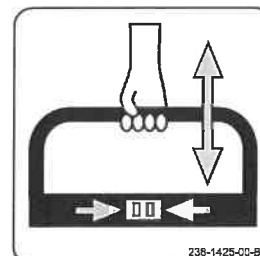
Model 59 EZ Glide Evacuation Chair

- Minimum of two trained operators required
- Use only as described in users' manual
- Free users' manuals: 1-800-733-3766 or www.ferno.com



Label J

Basic Safety Guidelines and Load Limit



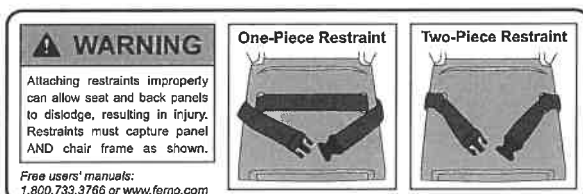
Label B

Instruction for Adjusting Lift Bar Height

Pull then Fold/Unfold Chair

238-1425-00-C

Label C - Instruction for Folding and Unfolding Chair



Label 234-1440-00

Safety Instruction:
How to Attach

One- and Two-Piece Restraints

2 - OPERATOR SKILLS AND TRAINING

2.1 Skills

Operators using the chair need:

- ☐ a working knowledge of emergency patient-handling procedures.
- ☐ the ability to assist the patient.
- ☐ a complete understanding of the procedures described in this manual.

2.2 Training

Trainees need to:

- ☐ follow a training program designed by their training officer.
- ☐ read this manual. For additional free users' manuals, contact Ferno Customer Relations (page 34).

! WARNING

Untrained operators can cause injury or be injured. Permit only trained personnel to operate the chair.

- ☐ practice with the chair before using it in regular service.
- ☐ be tested on their understanding of the chair.
- ☐ record their training information. A sample training record sheet is provided on page 35.

3 - ABOUT THE CHAIR

3.1 Chair Description

The Model 59-T and Model 59 EZ Glide™ Evacuation Chairs (referred to as the "chair" in this manual) are emergency patient-handling devices designed to transport a seated patient up and down stairs and over flat surfaces.

The chair is for professional use by a minimum of two trained operators. A third person to "spot" may be required by local protocols, and additional help may be required when working with heavy patients.

The Model 59-T is designed with belted tracks that enable operators to "glide" the chair down stairs instead of carrying it. The Model 59 is untracked and is carried down stairs.

Chair features include:

- Belted track system for "gliding" chair down stairs (Model 59-T only)
- Choice of molded ABS seat and back panels or soft vinyl seating
- 5-position extending lift bar at rear of chair
- 5-position telescoping front lift handles
- 6" rear locking wheels
- 4" front swivel wheels
- Folding footrest
- Ankle restraint
- Multiple patient restraint options

Optional Accessories:

- Rear lift handles, locking or non-locking
- IV bag holder
- O₂ bottle holder
- Headrest (head pad with strap)
- Kwik Klip™ Restraint System
- Secure Mount (with spring release) for storing chair in ambulance or station
- Bracket (with hooks) for storing chair in station

WARNING

Improper use of the chair can cause injury. Use the chair only for the purpose described in this manual.

3.2 General Specifications

Height

Maximum 63.5 in/161 cm

Minimum 37.5 in/95 cm

Width

Overall 20.313 in/51.6 cm

Seat 16.5 in /42cm

Depth (front to back, Model 59-T)

Tracks Closed, Handles Retracted 28 in/73 cm

Tracks Open, Handles Extended 51 in/130 cm

Depth (front to back, Model 59)

Handles Retracted 27 in/69 cm

Handles Extended 40 in/102 cm

Folded (Model 59-T)

..... 37.5 in x 20.313 in x 8 in

..... 95 cm x 51.6 cm x 20 cm

Folded (Model 59)

..... 37.5 in x 20.313 in x 7 in

..... 95 cm x 51.6 cm x 18 cm

Weight*

Model 59-T 33 lb/15 kg

Model 59 26 lb/12 kg

Load Limit 500 lb/227 kg

* without restraints or accessories

Some specifications are rounded to the nearest whole number. Metric conversions are calculated before rounding the Imperial measurements. For more information, contact Ferno Customer Relations (page 34).

Ferno reserves the right to change specifications without notice.

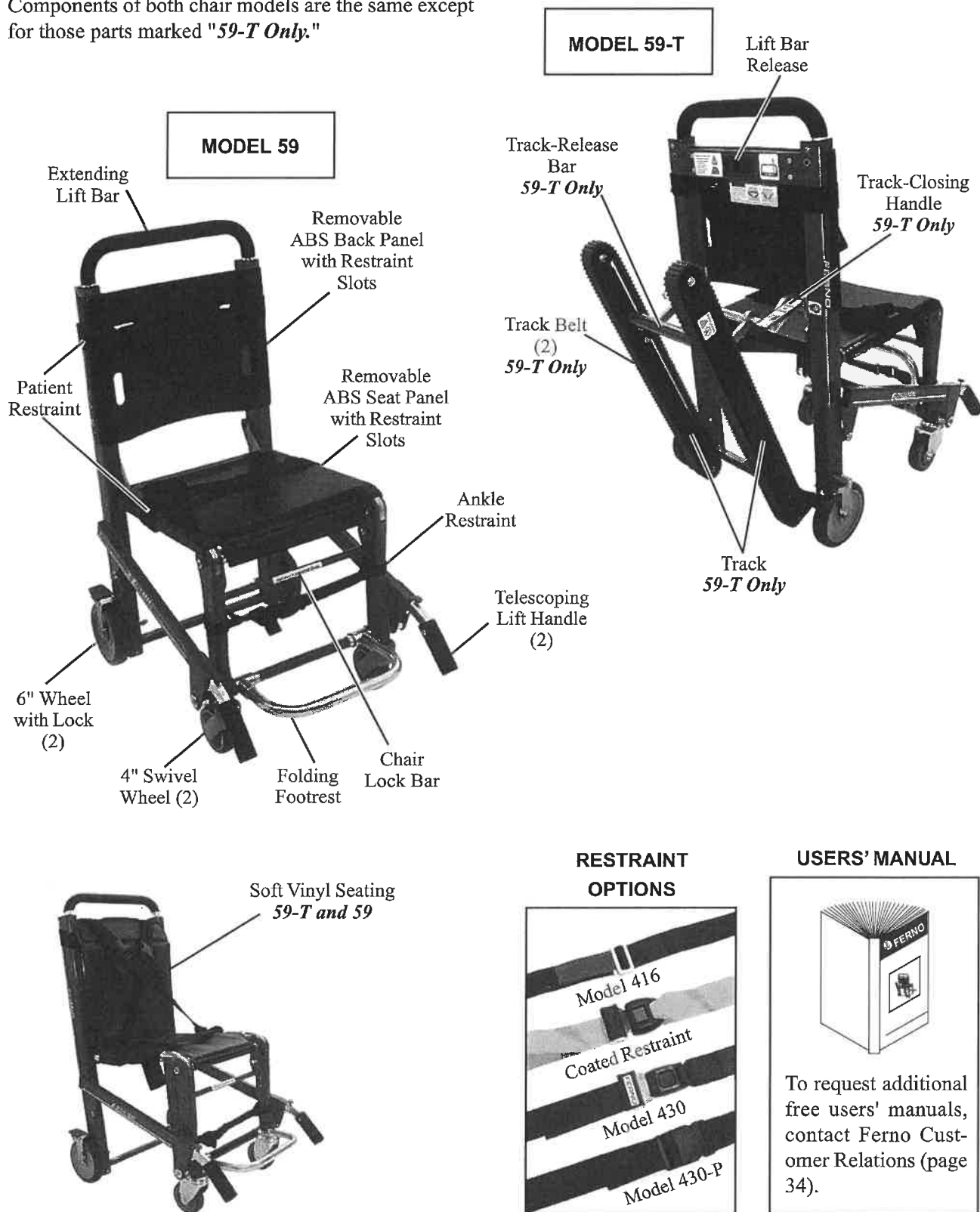
LOAD LIMIT



Inspect the chair if the load limit has been exceeded
(see *Inspecting the Chair*, page 24).

3.3 Components - Model 59-T and Model 59

Components of both chair models are the same except for those parts marked "*59-T Only*."



4 - CHAIR SETUP

4.1 Restraint Configurations for Chair with ABS Panels

Follow local protocols when choosing a configuration. Two possible configurations are described below.

HORIZONTAL CONFIGURATION

Use one restraint for the chest and one restraint for the lap (Figure 1).

1. Attach the chest straps through matching horizontal or vertical slots in the backrest panel.
2. Attach the lap straps through the seat panel slots.

CRISS-CROSS CONFIGURATION

Use two restraints for the torso. Ferno recommends using a third restraint for the lap (Figure 2).

1. Attach one strap of a restraint through a vertical slot on the backrest panel of the chair.
2. Attach the other strap of the restraint through the seat panel slot on the opposite side of the chair.
3. Repeat with the second restraint, attaching its straps to opposite sides of the chair.
4. Attach the lap restraint through the seat-panel slots.

4.2 Using One-Piece Restraints

Ferno recommends using two-piece restraints with the backrest and seat panels, but if you choose to use one-piece restraints, they must capture the panel and frame, as follows:

1. Work from the patient side of the panel and feed the ends of the restraint through the slots on opposite sides of the panel.
2. Wrap the restraint around the chair frame, capturing the panel **and** the frame (Figure 3 Top).
3. Buckle the restraint (Figure 3 Inset) and adjust the length.



Figure 1 -Horizontal Restraint Configuration

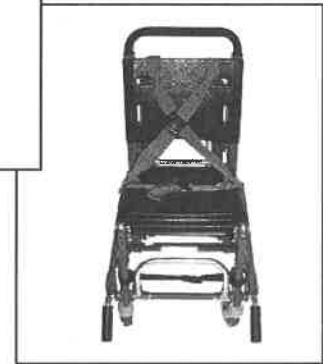
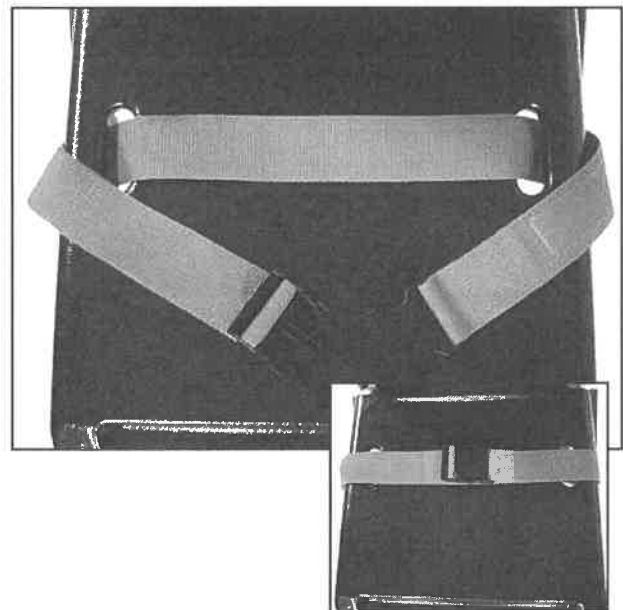


Figure 2 - Criss-Cross Restraint Configuration with Lap Belt

WARNING

Attaching one-piece restraints improperly can allow seat and back panels to dislodge, resulting in injury. Restraints must capture panels **AND** chair frame.



**Figure 3 - Top: Correctly Wrapped Restraint
Inset: Restraint Fastened**

4.3 Ankle Restraint

Attach the two-piece ankle restraint to the front legs of the chair.

To attach the restraint:

1. Unbuckle the restraint to separate the straps.
2. Wrap a strap around one front leg of the chair and thread the buckle through the loop (Figure 4).
3. Pull the strap until the looped end is tight around the chair leg (Figure 5).
4. Attach the remaining strap to the other front leg of the chair.
5. Buckle the restraint and adjust the length (Figure 6).

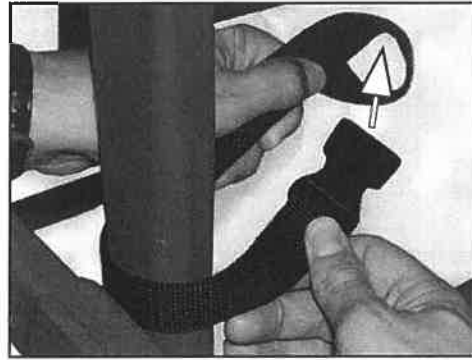


Figure 4 - Threading Buckle Through Loop

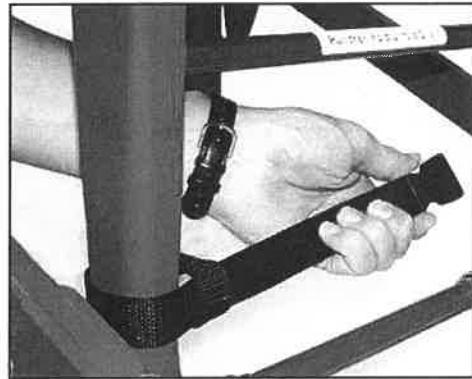


Figure 5 - Tightening Strap

4.4 Attaching Restraints to Chair With Soft Vinyl Seating

With soft vinyl seating, use the criss-cross restraint configuration plus a lap restraint (Figure 2, page 10).

Attach restraints as follows:

1. Unbuckle a restraint to separate the straps.
2. Attach the strap with the female buckle piece to the left or right side of the backrest frame (Figure 7). Follow instructions in the restraint users' manual for attaching a two-piece restraint.
3. Attach the strap with the male buckle piece to the exposed area of the seat frame on the opposite side of the chair.
4. Repeat steps 1-3 to attach the second torso restraint.
5. Attach a lap restraint alongside the restraints already attached to the seat frame.
6. Fasten and adjust the restraints.



Figure 6 - Ankle Restraint Attached



Figure 7 - Torso Restraints on Chair with Soft Vinyl Seating

5 - USING THE FEATURES

5.1 Chair Lock Bar

The red lock bar below the front edge of the seat disengages the lock for folding and unfolding the chair. Before seating a patient, verify that the chair is completely unfolded and the lock is engaged.

FOLDING THE CHAIR

1. Buckle the restraints and adjust them to prevent interference when folding the chair.
2. Roll the chair backward a foot or two to reverse the swivel wheels (Figure 8)
3. Stand at the side of the chair and grasp the chair backrest with one hand and the lock bar with the other hand (Figure 9).
4. Pull the lock bar forward, **then** begin folding the seat toward the backrest.

As you fold the seat, tilt the chair forward a little (Figure 10) to keep the front wheels turned outward so they will not hold the frame away from the seat and prevent the lock from engaging.

5. Press the seat against the backrest until the lock engages (Figure 11).
6. Verify the lock is engaged by pulling the seat away from the backrest without pulling the lock bar. The seat will not move if the lock is engaged.

UNFOLDING THE CHAIR

1. Stand beside the chair and grasp the backrest with one hand and the lock bar with the other hand.
2. Pull the lock bar forward, then pull the seat away from the backrest until it is fully unfolded and the lock engages.
3. Verify that the lock has engaged by holding the backrest in place while pulling up on the chair frame at the front of the seat without pulling the lock bar. The chair will not fold if the lock is engaged.



Figure 8 - Aligning the Wheels

Figure 9 - Disengaging the Lock

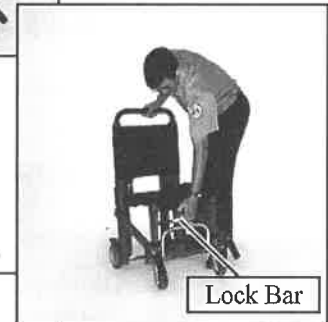


Figure 10 - Folding the Chair



Figure 11 - Engaging the Lock



Important

The chair lock must be disengaged **before** beginning to fold or unfold the chair. Pull the lock bar forward, **then** begin to fold or unfold the chair.

5.2 Track System - Model 59-T Only

The EZ Glide track system enables operators to glide the chair down stairs instead of lifting and carrying it.

GUIDELINES FOR USING THE TRACK SYSTEM

- Using the chair on stairs requires a minimum of two trained operators. Ferno recommends using a third person as a "spotter" (see *Gliding the Chair Down Stairs*, page 18).
- Verify that the track system is fully opened and locked into place before using it.
- Never lubricate track belts. Lubricated track belts can perform unpredictably, resulting in injury to the patient and/or operators.
- Moisture, water, snow, ice, or debris on or between the track and belts can cause irregular track-belt performance that results in sudden changes in the weight operators must support. Make sure the track and track belts are clean and dry before using the chair on stairs.
- Water, snow, ice, or debris on the stairs can cause poor footing for operators. To avoid possible injury, clear the stairs or select an alternate route.

OPENING THE TRACK

1. Grasp the track-release bar located near the top of the track (Figure 12) and firmly pull it back until the track locks into the fully extended position.
2. Verify that the lock is engaged by trying to push the track closed. If the lock is fully engaged the track will not move.

CLOSING THE TRACK

With your hand, push down on the red track-closing handle (Figure 13) until the track closes completely.

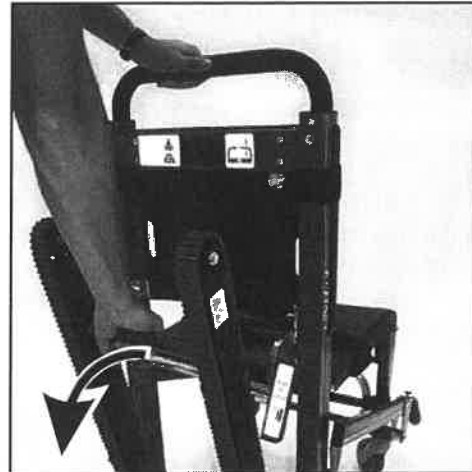


Figure 12 - Opening the Track



Figure 13 - Closing the Track

⚠ WARNING

Using the chair with the track unlocked can cause injury. Verify that the track is locked before transporting the patient.

⚠ WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the track or belts.

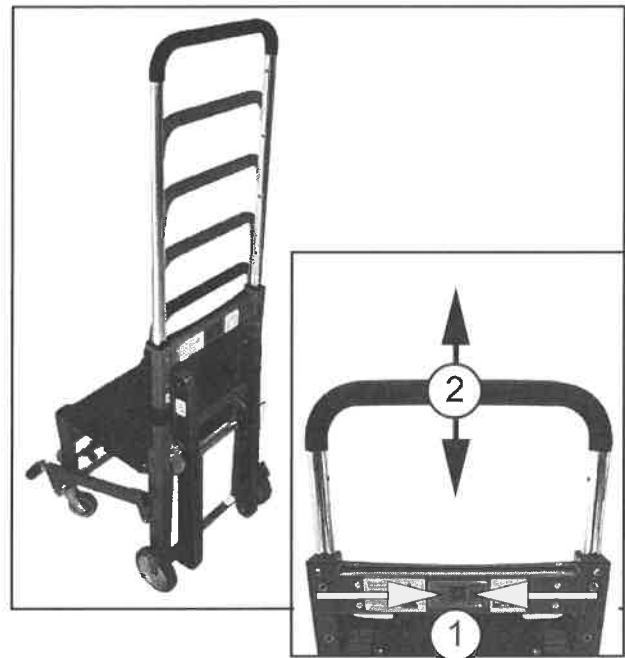
5.3 Extending Lift Bar

Grasp the lift bar to move and guide the chair as you glide it down stairs, carry it up stairs or over obstacles, and roll it.

The lift bar adjusts to five locked positions (Figure 14, Left). Adjust the height according to operator preference and the task or situation at hand.

EXTENDING AND RETRACTING THE LIFT BAR

1. With one hand, squeeze the lift-bar release tabs together and with the other hand grasp the lift bar and raise or lower it (Figure 14, Inset).
2. Verify that the lift bar is locked by trying to raise or lower it without squeezing the release tabs. When the lock is engaged the lift bar will not move.



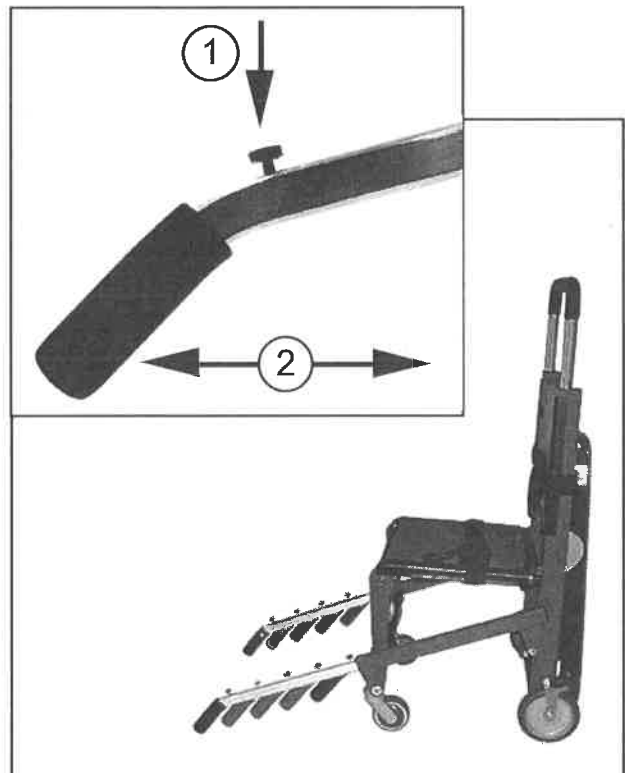
**Figure 14 - Left: Lift-Bar Positions
Inset: Adjusting Lift-Bar Height**

5.4 Telescoping Lift Handles

The telescoping lift handles can be adjusted to five locked lifting positions (Figure 15, Right). Adjust the handles according to operator preference and the task at hand.

EXTENDING AND RETRACTING THE LIFT HANDLES

1. Press the release button (Figure 15, Inset) and push or pull the handle until it is near the stop point desired.
2. Release the button and slide the handle a little forward or backward until it locks into the stop point.
3. Verify that both handles are locked by trying to push or pull them without pressing the release buttons. When the locks are engaged, the handles will not move.



**Figure 15 - Right: Lift-Handle Positions
Inset: Extending/Retracting a Lift Handle**

5.5 Footrest

The footrest has two positions: raised, for storage, (Figure 16) and lowered for use (Figure 17).

To lower the footrest, swing it down until it stops.

To raise the footrest, swing it up until it stops.

GUIDELINES FOR USING THE FOOTREST

Use the footrest properly to ensure that it does not interfere with patient's or operators' feet.

- Before transferring the patient onto the chair, make sure the footrest is raised in the storage position.
- When preparing to transfer the patient off the chair, unfasten the ankle restraint and raise the footrest into the storage position **before** unfastening the patient's torso and lap restraints. This will prevent the patient from attempting to stand before the footrest has been stored out of the way of his/her feet.
- Keep the footrest raised when it is not in use.



Figure 16 - Footrest Raised for Storage



Figure 17 - Footrest Lowered for Use

Important

Raise the footrest into the storage position **before** transferring the patient onto or off from the chair.

5.6 Wheel Locks

The rear wheels of the chair are fitted with wheel locks to help keep the chair from rolling during patient transfer.

Stay with the chair and maintain control of it at all times. Do not use the wheel locks as a substitute for operator control.

To engage a wheel lock, press down on the rear end of the lock pedal (Figure 18).

To disengage a wheel lock, press down on the forward end of the lock pedal (Figure 19).



Figure 18 - Wheel Lock Engaged



Figure 19 - Wheel Lock Disengaged

6 - USING THE CHAIR

6.1 Before Placing the Chair in Service

- ☐ Personnel who will work with the chair need to read this manual.
- ☐ Set up the chair, following instructions in *Chair Setup* (see Pages 10, 11).
- ☐ Confirm that the chair operates properly. Follow instructions in *Inspecting the Chair*, page 24.

6.2 General Guidelines for Use

- Using the chair requires a minimum of two trained operators.
- Ferno recommends that a third trained person serve as a "spotter" while the chair is being moved up or down stairs.
- Operators may need help when working with heavy loads (patient and equipment). See *Using Additional Help*, page 22, for recommended placement of operators and helpers.
- Operators work together at all times. Communicate with one another and coordinate your actions to operate the chair.
- Follow standard emergency patient-handling procedures when operating the chair.
- Stay with the patient at all times.
- Always use patient restraints.

WARNING

Improper operation can cause injury. Operate the chair only as described in this manual.

WARNING

An unattended patient can be injured. Stay with the patient at all times.

WARNING

An unrestrained patient can fall off the chair and be injured. Use restraints to secure the patient on the chair.

6.3 Transferring the Patient

Always assist the patient onto and off from the chair.

ASSISTING THE PATIENT ONTO THE CHAIR

1. Unfold the chair and verify that it is locked.
2. Engage the locks on the rear wheels.
3. Make sure the footrest is in the storage position.
4. Assist the patient onto the chair using accepted practices and following local protocols.
5. Fasten and adjust the torso and lap restraints.
6. Lower the footrest and place the patient's feet on it.
7. Fasten and adjust the ankle restraint.

ASSISTING THE PATIENT OFF FROM THE CHAIR

1. Unfasten the ankle restraint.
2. Raise the footrest to the storage position.
3. Unfasten the torso and lap restraints.
4. Assist the patient off from the chair using accepted practices and following local protocols.

6.4 Rolling the Chair

GENERAL GUIDELINES

- Roll the chair on smooth, flat surfaces whenever possible (Figure 21).
- For patient comfort, pull the chair backward over low obstacles such as door sills.
- Use the extending lift bar and telescoping foot-end handles to lift and carry the Model 59 chair over curbs, obstacles, rough surfaces and rough terrain.
- Use the tracks on the Model 59-T chair to "glide" the chair down over curbs or single steps (Figure 22).

TO ROLL THE CHAIR

1. **Head-End Operator:** Release the wheel locks.
2. **Head-end Operator:** Adjust the lift bar to a comfortable height and grasp it to push and guide the chair on all four wheels (Figure 21), or tilt the chair back and roll it on its rear wheels.
2. **Foot-end Operator:** Assist the head-end operator as needed and attend the patient.

**Figure 20 -
Patient Secured
in Chair with
Restraints**



**Figure 21 -
Rolling the Chair**



**Figure 22 - Gliding the Chair Down a
Curb**

6.5 Gliding the Chair Down Stairs - Model 59-T Only

GENERAL GUIDELINES

- Using the chair on stairs requires a minimum of two operators. Use additional help as needed to control the chair (see *Using Additional Help*, page 22).
- Ferno recommends that the two operators face each other when transporting a patient down stairs and that a third trained person “spot” for the foot-end operator. However, the foot-end operator may face forward (with back to patient) if desired. Follow your local protocols for carrying chairs.
- Remove any water, ice, snow, or debris from the stairs before using the chair on them.
- Remove any water, ice, snow, or debris from the track and tread belts before using the chair on stairs.
- Verify that the track is locked in the open position before starting down the stairs with the chair.

GLIDING THE CHAIR DOWN STAIRS

1. **Head-End Operator:** Roll the chair to the stairs and engage the wheel locks.
2. **Foot-End Operator:** Extend the foot-end lift handles to the desired stop point. Verify that both handles are locked.
3. **Spotter:** Stand below the foot-end operator with a hand on the operator's back to help steady and guide him/her throughout the descent.
4. **Head-End Operator:** Pull the track system toward yourself until the track locks open. Verify that the track is locked.
5. **Head-End Operator:** Raise the lift bar to the desired position and verify that it is locked (Figure 23).
6. **Head-End Operator:** Disengage the wheel locks (Figure 23) and tilt the chair back.
7. **Both Operators:** Working together, guide the chair over the edge of the top step, allowing the track belts to engage the step (Figure 24).

⚠ WARNING

Using the chair with the track unlocked can cause injury. Verify that the track is locked before transporting the patient.

⚠ WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the track or belts.



Figure 23 - Preparing Model 59-T for the Descent



Figure 24 - Track Belts Engaging Top Step

8. Move the chair slowly downward until the tracks are resting on the top two or three steps. This establishes the glide angle (Figure 25).
9. To maintain the glide angle as you descend, work together as follows:
 - The **head-end operator** applies slight downward pressure on the extended lift bar.
 - The **foot-end operator** applies slight upward pressure on the foot-end lift handles.
10. **Both Operators:** When the chair reaches the bottom of the steps and the rear wheels are on the floor, the head-end operator tips the chair forward until all four wheels are on the floor and the foot-end operator retracts the lift handles (Figure 26).
11. **Head-End Operator:** Close the tracks and adjust the lift bar to a comfortable height, then roll the chair.

TO PAUSE DURING THE DESCENT

To pause during the descent, tilt the chair forward just enough to allow the rear wheels to rest on the step while both operators hold the chair in place (Figure 27).

To continue down the stairs, tilt the chair back to the glide angle and engage the belts on the steps.

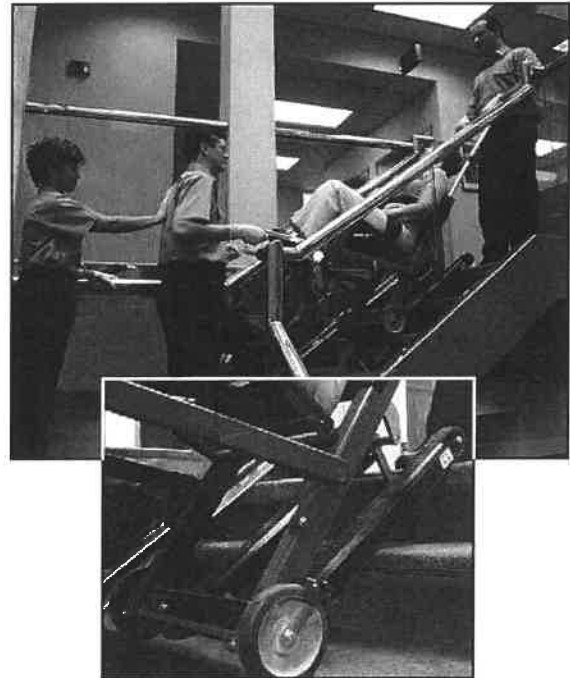


Figure 25 - Establishing the Glide Angle



Figure 26 - Preparing to Roll the Chair



Figure 27 - Pausing on the Stairs

6.6 Transporting the Patient Down Stairs - Model 59 Only

GENERAL GUIDELINES

- Carrying the chair down stairs requires a minimum of two operators. Use additional help as needed (see *Using Additional Help*, page 22).
- Ferno recommends that the two operators face each other when transporting a patient down stairs and that a third person “spot” for the foot-end operator. However, the foot-end operator may face forward (with back to patient) if desired. Follow your local protocols for carrying chairs.

CARRYING THE CHAIR DOWN STAIRS

1. **Head-End Operator:** Roll the chair to the stairs and engage the wheel locks.
2. **Foot-End Operator:** Extend the foot-end lift handles to the desired stop point. Verify that both handles are locked and maintain your grasp.
3. **Spotter:** Stand below the foot-end operator with a hand on the operator's back to help steady and guide him/her throughout the descent.
4. **Head-End Operator:** Raise the lift bar to the desired position and verify that it is locked.
5. **Head-End Operator:** Disengage the wheel locks and tilt the chair back.
6. **Operators and Spotter:** Operators work together to lift the chair and carry it down the stairs. The spotter keeps a hand on the foot-end operator's back and provides verbal guidance (Figure 28).

Note: To pause during the descent, allow the rear wheels of the chair to rest on a step while both operators hold the chair in place (Figure 29). To continue down the stairs, tilt the chair back and lift and carry it.

8. **Operators:** At the bottom of the stairs, the operators set the chair on the floor and retract the lift handles.
9. **Head-End Operator:** Adjust the lift bar to a comfortable height before rolling the chair.



Figure 28 -Carrying the Model 59 Chair Down Stairs



Figure 29 -Pausing on the Stairs - Model 59 Chair

6.7 Transporting the Patient Up Stairs -Models 59-T and 59

GENERAL GUIDELINES

- Carrying the chair up stairs requires a minimum of two operators. Use additional help as needed (see *Using Additional Help*, page 22).
- The two operators face each other when transporting a patient up stairs. Ferno recommends that a third person “spot” for the head-end operator. Follow your local protocols for carrying chairs.

CARRYING THE CHAIR UP STAIRS

1. **Head-End Operator:** Roll the chair to the bottom of the stairs and position it with the patient's back to the stairs.
2. **Head-End Operator:** Extend the lift bar to the desired position and verify that it is locked.
3. **Spotter:** Stand above the head-end operator with a hand on the operator's back to help steady and guide him/her throughout the ascent.
4. **Foot-End Operator:** Extend the foot-end lift handles to the desired position and verify that both handles are locked Figure 30).
5. **Both Operators and Spotter:** Working together, the operators grasp the lift bar and lift handles and carry the chair up the stairs. The spotter keeps a hand on the head-end operator's back and provides verbal guidance (Figure 31).
6. **Both Operators:** At the top of the stairs, the head-end operator sets the rear wheels of the chair on the floor and rolls the chair backward until the front wheels are securely on the floor.
7. **Foot-end Operator:** Retract the foot-end lift handles.
8. **Head-End Operator:** Adjust the lift bar to a comfortable height before rolling the chair.



Figure 30 - Preparing to Carry Model 59-T (Tracked) Chair Up Stairs.

Important

The EZ Glide track system was designed to assist in descending stairs. It can be used to ascend stairs, but in some circumstances it may be easier to lift and/or carry the chair up stairs.



Figure 31 - Carrying the Model 59 (Untracked) Chair Up Stairs

6.8 Using Additional Help

Operating the chair requires a minimum of two trained operators. Ferno recommends that the operators and helpers at opposite ends of the chair face each other when transporting a patient up or down stairs, and that a third trained person “spot” for the lead operator. However, all applicable local protocols for carrying chairs should be being followed.


The trained operators should maintain control of the chair and operate the controls, and the designated lead operator should direct all helpers. The chart below shows suggested placement for operators and helpers.

Direction	Rolling on Flat Surface
Two Operators + Two Helpers	

Direction	Gliding Down Stairs on Track System or Carrying Chair Down Stairs	Carrying Chair Up Stairs
Two Operators + One Helper		
Two Operators + Three Helpers		

Key: O = Operator H = Helper S = Spotter P = Patient

LOAD LIMIT



Inspect the chair if the load limit has been exceeded (see *Inspecting the Chair*, page 24).

! WARNING

Helpers can cause injury or be injured. Maintain control of the chair, operate the controls, and direct all helpers.

7 - MAINTENANCE

7.1 Maintenance Schedule

The chair requires regular maintenance. Set up and follow a maintenance schedule. A sample maintenance record sheet is provided on page 34. The table at the right represents minimum intervals for maintenance.

When using maintenance products, follow the manufacturers' directions and read the manufacturers' material safety data sheets.

7.2 Disinfecting/Cleaning Restraints

Ankle Restraint: Place buckled restraint in a mesh bag and launder in a washing machine using warm water, a disinfectant soap, and gentle agitation. Hang the restraint to dry. Do not put it in a dryer.

Chest and Lap Restraints: Disinfect and clean restraints as directed in the restraint users' manual.

7.3 Disinfecting/Cleaning Chair

To disinfect: Remove restraints and seat and backrest panels or soft vinyl cover. Wipe all surfaces of the chair and panels or cover with disinfectant. Follow disinfectant manufacturer's directions.

To clean: Wash panels or cover, and all parts of the chair, with warm water and a mild detergent. Rinse with clean water. Dry with a towel or allow to air-dry.

7.4 Cleaning Track and Belts

To ensure predictable belt performance, it is important to keep the track and belts free of oil, grease, dirt, and debris.

1. Hold the belts away from the track frame and remove any debris.
2. Clean both sides of the track frame, and both belts, with SD-20 All-Purpose Cleaner and a clean cloth. Follow instructions on the container.
3. Dry track and belts thoroughly.

Note: To order SD-20 Cleaner, call Spartan Chemical Company at 1.800.537.8990.

Minimum Intervals for Maintenance	Each Use	As Needed	Each Month
Disinfecting Chair - p. 23	•		
Cleaning Chair - p. 23		•	
Cleaning Track System - p. 23		•	
Inspecting Chair - p. 24		•	•
Inspecting Track System - p. 24	•	•	
Lubricating Chair - p. 25		•	

WARNING

Improper maintenance can cause injury. Maintain the chair only as described in this manual.

Important

Disinfectants and cleaners containing bleach, phenolics, or iodines can damage the chair. Use caution when disinfecting and cleaning with products containing these chemicals.

Important

Water under high pressure, or steam, penetrates joints, flushes away lubricant, and causes corrosion. Use caution when cleaning moving parts such as joints and hinges.

Important

Using abrasive cleaning compounds or applicators on the chair can cause damage. Do not use abrasive materials to clean the chair.

7.5 Inspecting the Chair

Have your service's equipment maintenance personnel inspect the chair at regular intervals. Track and track belts should be inspected after each use.

Follow the checklists on this page and work the chair through all its functions as described in this manual.

If inspection shows damage or excessive wear, remove the chair from service until repairs are made.

INSPECTION CHECKLIST FOR MODEL 59-T AND MODEL 59 CHAIRS

- ☐ Are all components present?
- ☐ Is the chair free of excessive wear?
- ☐ Are all screws, nuts, bolts, rivets, and roll pins securely in place?
- ☐ Do all moving parts operate smoothly and properly?
- ☐ Do all locks on the chair operate properly?
- ☐ Does the chair roll smoothly?
- ☐ Are the restraints properly installed?
- ☐ Is restraint webbing in good condition with no cuts or frayed edges?
- ☐ Are restraint buckles free of visible damage and do they operate properly?
- ☐ Do installed accessories operate properly without interfering with chair operation?

INSPECTION CHECKLIST FOR TRACK AND BELTS

- ☐ Are the track and belts free of lubricant, dirt and debris?
- ☐ Is there visible damage to the track or belts?
- ☐ Are inner cords of belts visible (indicating the need for replacement)?
- ☐ Are the belt-tensioning bolts and nuts tight?
- ☐ Do the belts roll properly?
- ☐ Do the track and belts perform properly?

7.6 Lubricating the Chair - Model 59-T and Model 59

Disinfect and clean the chair before applying lubricant.

There are two identical lubrication points on the chair. They are located where the brass bushing in the chair lock bar slot meets the stainless steel slide in the chair leg (Figure 32).

Lubricate each lubrication point with **one** drop of SAE 30-weight oil, then move the lock bar back and forth a few times to work the oil into the slide. Remove any excess lubricant with SD-20 Cleaner.

Note: To order SD-20 Cleaner, call Spartan Chemical Company at 1.800.537.8990.

7.7 Do Not Lubricate Track System on Model 59-T

Never lubricate the track, the track belts, or any other part of the track system. Lubricants on the belts or track can cause the chair to perform unpredictably, resulting in injury to the patient and/or operators.

A label (Figure 33) instructing the user **not** to lubricate the track system is affixed to each side of the track. If these labels become damaged or worn, replace them immediately (see *Parts and Service*, page 30).

If track or belts pick up oil or grease during use or while the chair is being serviced, clean the track and belts with SD-20 All-Purpose Cleaner before using the chair again. See *Cleaning Track and Belts*, page 23, for cleaning instructions.

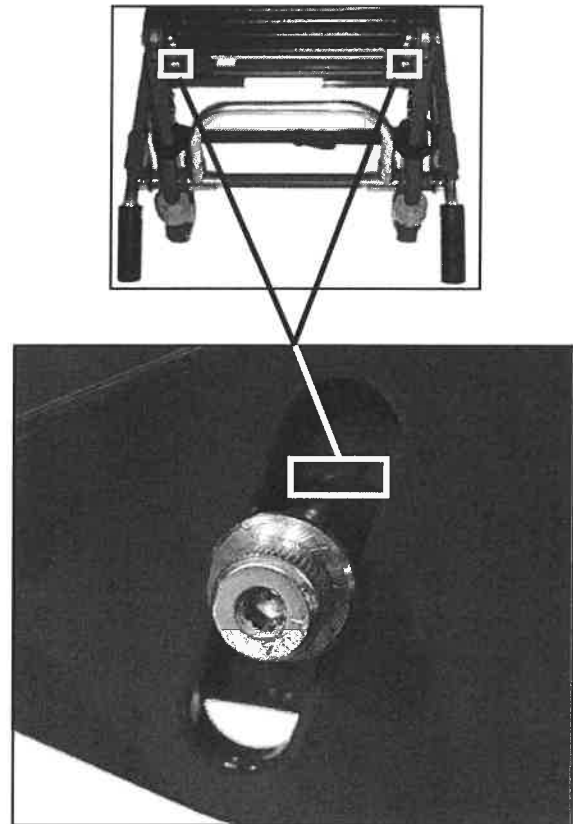


Figure 32-
Top: Lubrication Point Locations
Bottom: Lubrication Point Close-up

WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the track or belts.

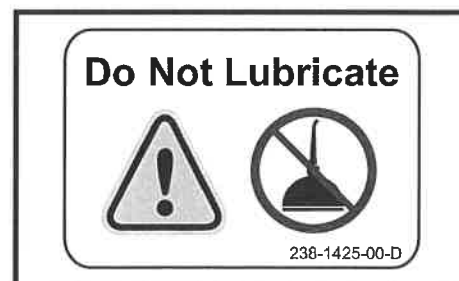


Figure 33 - Label on Chair Track

7.8 Adjusting Track-Belt Tension

WHEN TO ADJUST BELT TENSION

Track belt tension needs to be adjusted when:

- a nut and bolt become loose
- a belt pulls away from the track more than 1-1/2 in. (3.8 cm) when measured using Method 1 on Page 27.
- a belt pulls away from the track more than 1 in.(2.5 cm) when measured using Method 2 on Page 27.

Important

Adjusting the belt tension is a two-person operation.

TOOLS NEEDED

- 2 ea 7/16-inch Wrench
 1 ea #4 Phillips Screwdriver
 1 ea Ruler or Measuring Tape

TENSION-ADJUSTMENT

1. Open the track and lay the chair on its back on a workbench as shown in Figure 34

OR

Stand the chair on its wheels on a workbench, then open the track and engage both wheel locks.

2. Loosen the bolt and black cap locking nut located at the top end of the track (Figure 35).
3. Slide the #4 Phillips screwdriver into the adjustment slot (Figure 35).
4. While one person tensions the belt by using the #4 Phillips screwdriver to pull the belt roller toward the top of the track, the other person uses the two 7/16-inch wrenches to tighten the bolt and nut only enough to hold the tension (Figure 36).

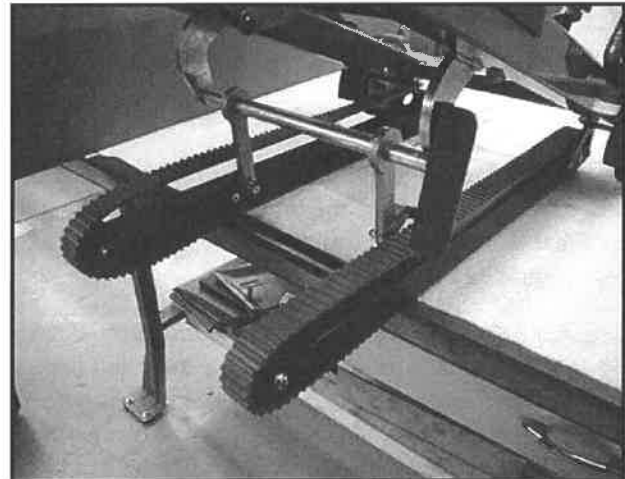


Figure 34 - Chair Positioned for Tensioning Procedure. (See Step 1 for alternate position.)

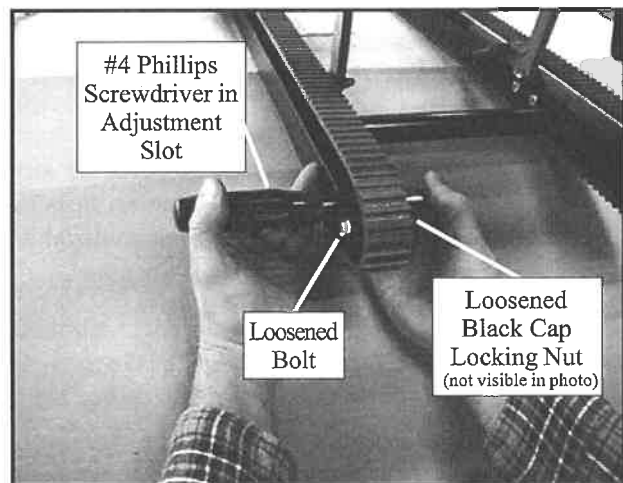


Figure 35 - Belt Ready for Tensioning



Figure 36 - Tensioning the Belt

5. There are two methods for checking belt tension. You can use whichever method you prefer, but do **not** use the chair position from one method with the measurement range from the other method.

Use Method 1 (below, left) if the chair is laying on its tracks on a work bench. Use Method 2 (below, right) if the chair is standing on its wheels.

It may be necessary to repeat the tensioning and measuring one or more times to achieve the correct belt tension.

6. When the belt tension is correct, finish tightening the bolt and nut to maintain the tension.
7. Repeat Steps 2-6 to adjust the tension of the other track belt.

METHOD 1

Chair Must Be Laying on Its Tracks on a Work Bench

Grasp the belt at the track midpoint and pull the belt away from the track to remove any slack, then measure the distance between the exposed surface of the track and the inner surface of the belt. Take the measurement at the track midpoint.

The belt is correctly tensioned when the measurement from the exposed surface of the track to the inner surface of the belt is 1-1/4 in. to 1-1/2 in. (3.175 cm to 3.8 cm), as in Figure 37.



Figure 37 - Checking Tension with Chair Laying on Its Tracks on a Work Bench

METHOD 2

Chair Must Be Standing on Its Wheels

Grasp the belt at the track midpoint and pull the belt away from the track to remove any slack, then measure the distance between the exposed surface of the track and the inner surface of the belt. Take the measurement at the track midpoint.

The belt is correctly tensioned when the measurement from the exposed surface of the track to the inner surface of the belt is 3/4 in. to 1 in. (1.9 cm to 2.5 cm) as in Figure 38.

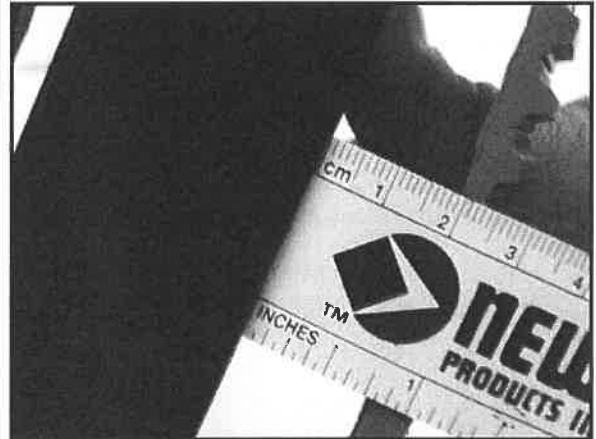


Figure 38 - Checking Tension with Chair Standing on Its Wheels

7.9 Reconditioning the Track Belts

Track belts need reconditioning when the inner surface becomes glassy or glazed. As this glazing occurs, the belts begin to move less freely over the steps and the belt teeth begin to skip, rather than roll, over the steps.

ITEMS REQUIRED FOR RECONDITIONING BELTS

- Permanent marker
- 50-80 grit sandpaper
- Wood block

To recondition the belts:

1. Place the chair on a workbench.
2. Apply wheel locks.
3. Roll the belt away from the track and mark the inner surface with a permanent marker to identify the starting point for sanding (Figure 39).
4. Place sanding block between belt and track and move the block up and down to sand the inner surface of the belt (Figure 40).

Note: Take care not to sand the surface of the track.

5. Repeat steps 3 and 4 with the other belt.
6. Secure a simulated patient weight to the chair and glide the chair down a flight of stairs to test whether the belts roll over the steps properly.

If the belts do not perform properly, you may need to re-sand them, or they may need to be replaced.

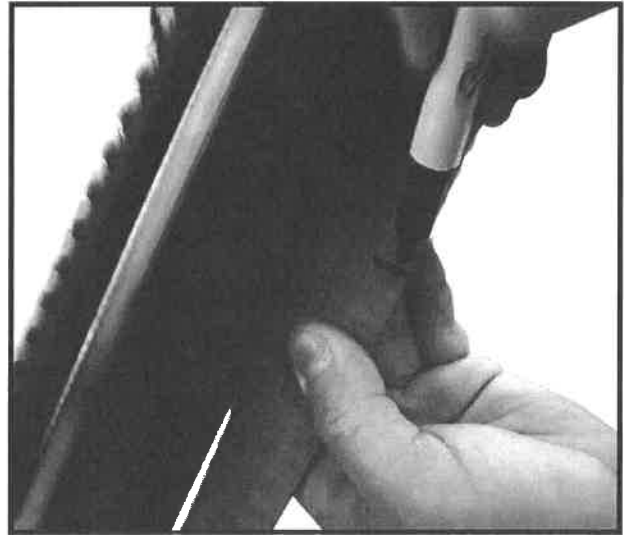


Figure 39 - Marking the Starting Point for Sanding the Belt

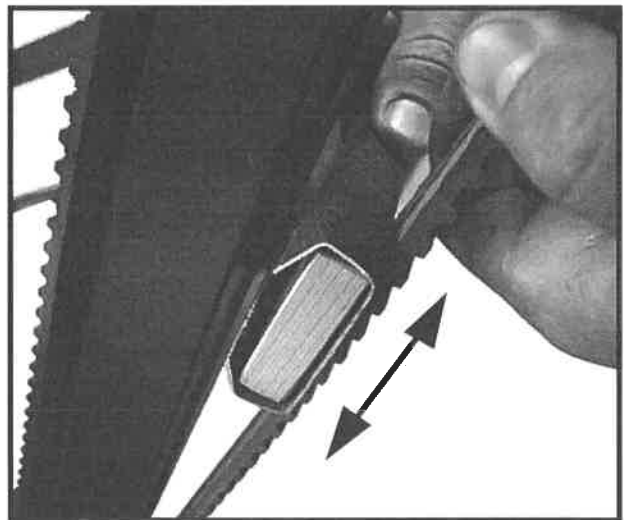


Figure 40 - Sand in Direction of Arrows

7.10 Removing and Attaching The ABS Panels

The molded ABS seat and backrest panels snap on and off the chair frame.

BACKREST PANEL

To remove the backrest panel: gently pull downward on the flange near one bottom corner and pull the corner of the panel away from the chair (Figure 41). Repeat at the opposite corner. Then slide the panel up off the two keepers at the top of the frame (Figure 42).

To attach the backrest panel: Orient the panel with the horizontal restraint slots uppermost. Slide the two holes in the top flange down over the keepers on the top of the backrest frame, then press both lower corners of the panel against the sides of the frame until they snap into place over their keepers.

SEAT PANEL

To remove the seat panel: Pull upward on the panel flange at each front corner to pop the panel free of the seat frame (Figure 43) then lift the panel off the chair.

To attach the seat panel: align the panel with the chair frame and press down to snap the panel onto the frame.

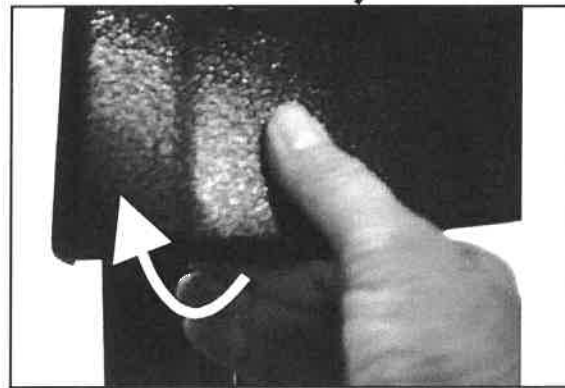
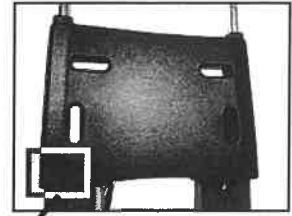


Figure 41 - Releasing a Bottom Corner Of the Backrest

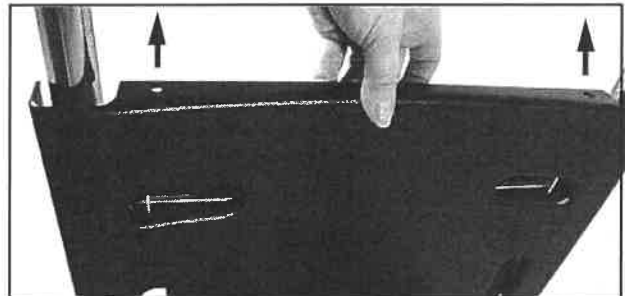


Figure 42 - Lifting the Backrest Panel Over the Keepers

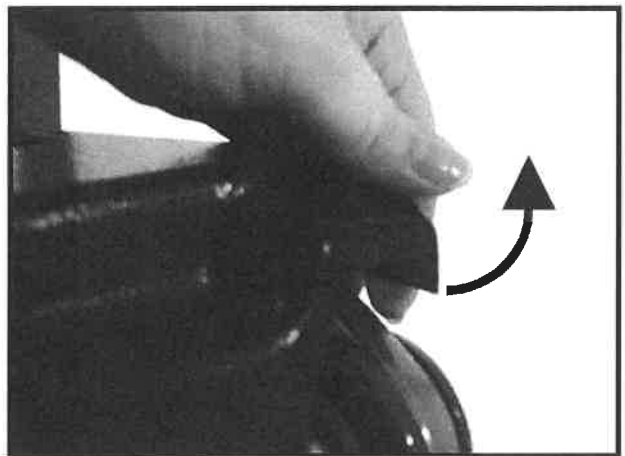


Figure 43 - Releasing a Corner Of the Seat Panel

7.11 Removing and Attaching The Soft Vinyl Seating

To remove the seating:

1. Unfasten the snap at each corner of the vinyl at the top of the backrest (Figure 44).
2. Lay chair on its back and unbuckle both retaining straps beneath the seat (Figure 45).
3. Unfasten the four snaps on the vinyl flap beneath the seat at the front of the chair (Figure 46).
4. Lift the cover off the chair and return the chair to the upright position.

To attach the seating:

1. Fasten the snap at each corner of the vinyl at the top of the backrest.
2. Lay chair on its back and fasten the buckles of both retaining straps.
3. Fasten the four snaps on the vinyl flap beneath the seat at the front of the chair.
4. Pull the free end of each buckled retaining strap until the strap is tight (Figure 47), then return the chair to the upright position.

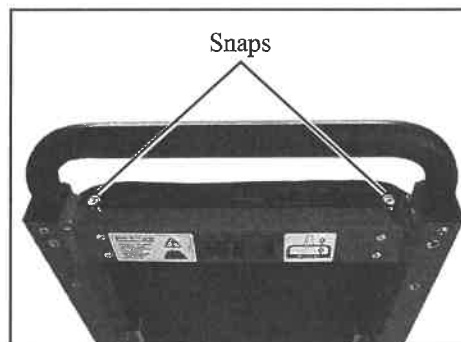


Figure 44 - Unfasten Snaps

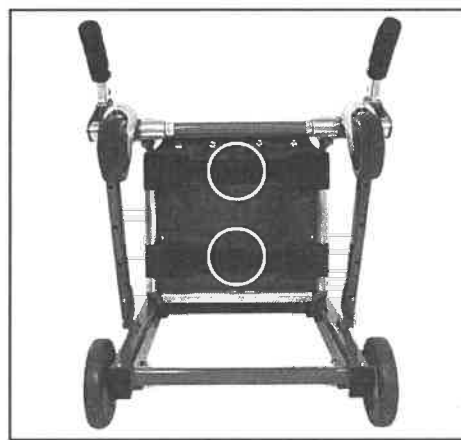


Figure 45 - Unbuckle Straps

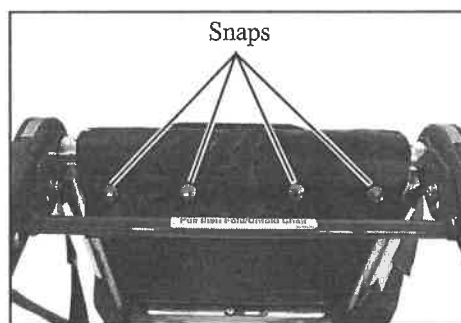


Figure 46 - Unfasten Seat Snaps

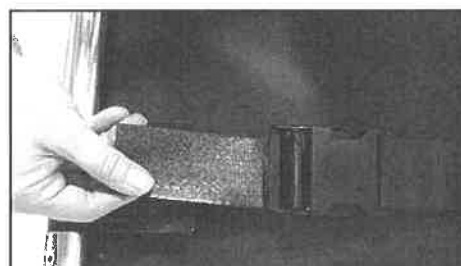


Figure 47 - Tighten Straps

8 - ACCESSORIES AND RELATED PRODUCTS

Ferno offers a full line of emergency medical service accessories (fasteners, IV poles, immobilizers, blankets, etc.). Selected items approved for use with the chair are listed here.

Always follow the instructions packed with accessories. Keep the instructions with this manual. Be aware of any special considerations (loading heights, door widths, etc.) when using accessories.

For product information, contact Ferno Customer Relations (page 34).



WARNING

Attaching improper items to the chair can cause injury. Use only Ferno-approved items on the chair.

8.1 EZ Glide Chair Accessories

Description	Part #
Kwik Klip™ Restraint System	031-4002
IV Bag Holder Complete	082-1976
IV Bag Holder Replacement Strap	082-1972
Headrest Complete	031-4000
Head Pad Replacement	082-1971
Head Strap Replacement	082-1970
Oxygen Cylinder Holder Complete	082-1977
Oxygen Cylinder Replacement Straps	031-3661
Non-Locking Rear Lift Handles, Pair	082-1974
Non-Locking Rear Lift Handle, Right	082-2008
Non-Locking Rear Lift Handle, Left	082-2007
Locking Rear Lift Handles, Pair	082-1975
Locking Rear Lift Handle, Right	082-2010
Locking Rear Lift Handle, Left	082-2009
Secure Mount Storage Brackets (with spring release)	082-2072
Storage Bracket (with hooks)	082-2073
Vinyl Storage Cover	031-4023

8.2 Restraints

Description	Part #
Ankle Restraint	082-1973
430 Restraint, 2-piece, 5 ft., black, metal buckle	031-3892
430 Restraint 2-piece, 7 ft., black, metal buckle	031-3911
430-P Restraint 2-piece, 5-ft., black, plastic buckle	031-3797
430-P Restraint, 2-piece, 7-ft., black, plastic buckle	031-3801
416 Restraint, 2-piece, 5 ft., black, metal rescue-style buckle	031-3928
416 Restraint, 2-piece, 7 ft., black, metal rescue-style buckle	031-3999
Coated Restraint, 2-piece, 5 ft., green nonabsorbent straps, metal buckle	E32032

Note: Models 430 and 430-P restraints also available in 5- and 7-ft. lengths in burgundy or orange.

9 - PARTS AND SERVICE

9.1 Parts and Service - U.S.A. and Canada

In the United States, to order parts or for professional repair, contact EMSAR® - the only agent authorized by Ferno to manage, service, and repair Ferno products. EMSAR factory-trained technicians use Ferno-approved parts and repair procedures. EMSAR has a franchise location serving you. For details, phone, fax, or visit EMSAR's web site.

1.800.73.EMSAR (Phone)
1.937.383.1051 (Fax)
www.EMSAR.com (Internet)

9.2 Parts and Service - Worldwide

To order Ferno parts and for professional repair, contact your Ferno distributor. Your distributor is the only agent authorized by Ferno to manage, service, and repair Ferno products.

9.3 Parts List

Ref. #	Description	Part #
1	ABS Backrest panel	190-1489
2	Track-close push handle	190-1500
3	ABS Seat panel	190-1490
4	Seat bumper, pair w/hardware (n/v)	190-1501
5	Telescoping handle assy, blue	090-5837
6	Telescoping handle, grip only	190-1495
7	4" front caster, complete	190-1494
8	Rear brake assy, right	090-5838
9	6" rear wheel w/hardware	190-1493
10	Ankle Restraint	090-5840
11	Track lower roller w/hardware	190-1498
12	Rear brake assy, left (n/v)	090-5839
13	Track belt only	190-1496
14	Track upper roller w/hardware	190-1497
15	Lift bar lock assy	190-1492
16	Lift bar handle, complete	190-1491
17	Soft Vinyl Seating	090-5841
18	Gas spring assy (n/v)	190-1499
19	Label sheet and logo (n/s)	190-1502



⚠ WARNING

Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the chair.

⚠ WARNING

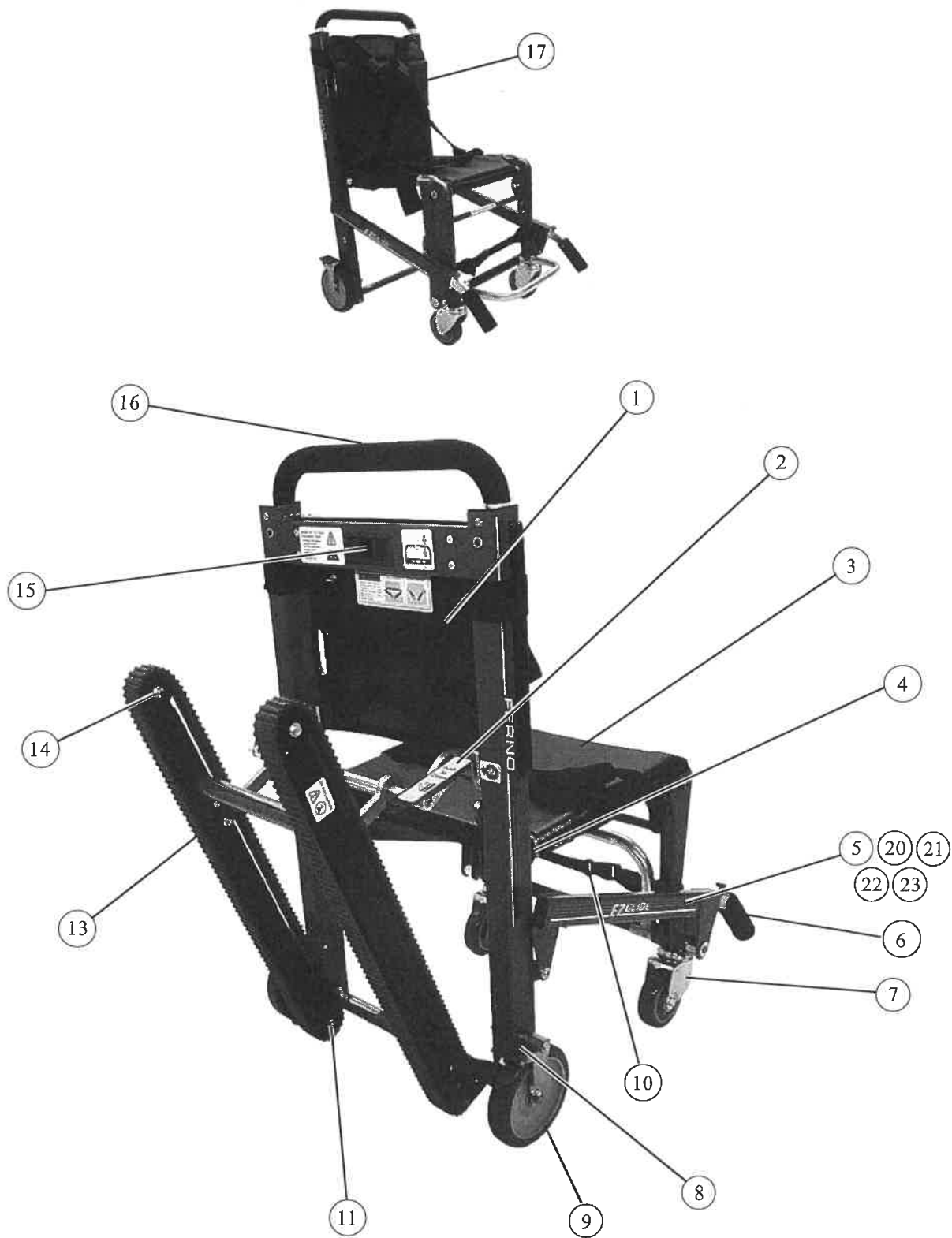
Modifying the chair can cause injury and damage. Use the chair only as designed by Ferno.

Ref. #	Description	Part #
20	Telescoping handle assy, red	090-5842
21	Telescoping handle assy, orange	090-5843
22	Telescoping handle assy, green	090-5844
23	Telescoping handle assy, platinum	090-5845

(n/s) = not shown

(n/v) = not visible in this photo

9.4 Parts Diagrams



10 - LIMITED WARRANTY

Limited Warranty Summary

Ferno products are warranted free from defects in material and workmanship for one year, except:

- External finishes (gelcoat, paint, powdercoat, decals, etc.) are warranted for 90 days.
- Soft goods (webbing, vinyl, fabric, foam, etc.) are warranted for 90 days.
- Fiberglass AquaCiser tanks are warranted against leakage for 5 years.
- Stainless hydrotherapy tanks are warranted against tank shell leakage and corrosion for 5 years.
- Mortuary products (except hydraulic parts and soft goods) are warranted for 2 years.
- Ambulance cots and transporters (except external finish and soft goods) are warranted for 2 years.
- EMS bags (replaceable bottom excluded) and backboards are warranted for lifetime replacement. (Damage caused by accident, abuse, misuse or improper care will be repaired at a reasonable charge for which you will be informed prior to the repair work being done.)

Ferno repairs are warranted for 90 days from the date of repair.

This limited warranty applies only when the product is used as described in the instructions provided. The warranty period begins when the product is shipped from Ferno or when you receive it if you have proof of delivery. Shipping charges are not covered by this limited warranty. Ferno is not liable for shipping damages or damages sustained through using the product.

Non-Ferno products sold by Ferno retain the product manufacturer's original warranties. Ferno offers no warranties of any kind additional to those of the product manufacturer, nor does Ferno assume any liability for products manufactured by others.

Limited Warranty Obligation

If a product is proven defective, Ferno will repair or replace it, or, at our option, refund the item's purchase price. In no event is Ferno liable for more than the selling price of the product. The purchaser accepts these terms in lieu of all damages.

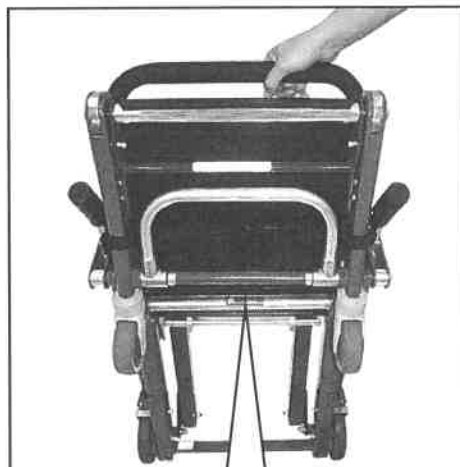
This is a summary of the limited warranty. The actual terms and conditions of the limited warranty, and the limitations of liability and disclaimers, are available upon request by calling 800-733-3766 or 937-382-1451.

11 - FERNO CUSTOMER RELATIONS

Customer service and product support are important aspects of each Ferno product. For assistance, please contact Ferno Customer Relations:

Please have the serial number of your EZ Glide Chair available when calling Ferno Customer Relations, and include it in all written communications.

Telephone (Toll-free)..... 1.877.733.0911
 Telephone 1.937.382.1451
 Fax (Toll-free) 1.888.388.1349
 Fax 1.937.382.6569
 Internet..... www.ferno.com



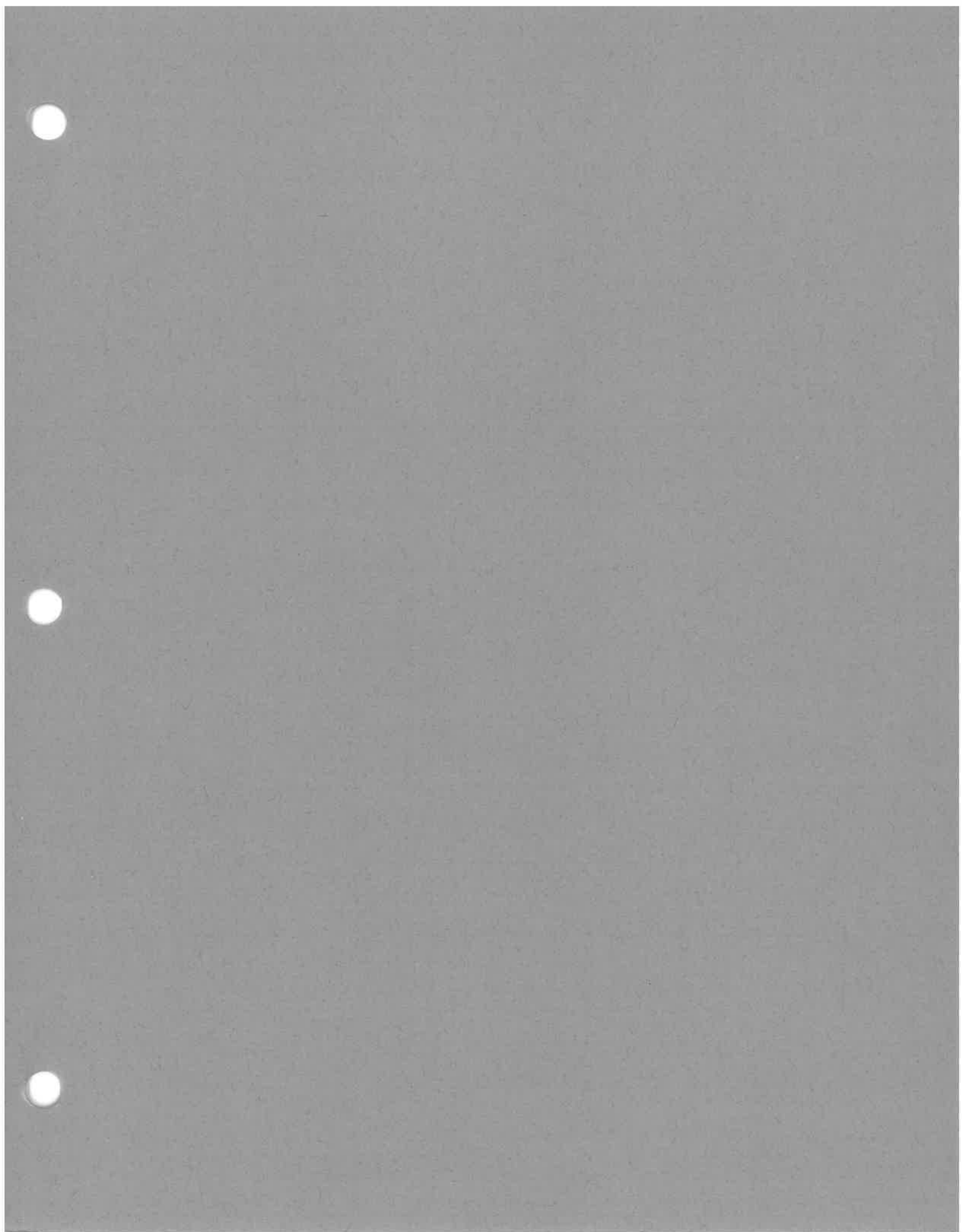
Serial Number _____

TRAINING RECORD

Date	Name	Training Method

MAINTENANCE RECORD

Date	Maintenance Performed	By





EMS Transport Unit Study Guide

Trainees are encouraged to go to

<http://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingClassMaterials.html>

and download and/or print the reference materials for the EMS transport unit model year that is assigned to their station.

